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AUGUST 1, 1935

ESTABLISHED 1855 Vol. 136, No. 5

Hot Weather Briefs

THE Scripps-Howard newspapers, staunch defenders of the New Deal and whose intellectual menagerie includes such stalwart conservatives as Heywood Broun, Harry Elmer Barnes, General Johnson and John Flynn are editorially urging the President to concentrate and finish one thing before he starts too many others. They emphasize the political danger inherent in delaying the expenditure of the $4,800,000,000 fund which was intended to put everybody to work before election day.

Of course it is no simple matter to spend $4.8 billions of dollars or even to throw them away. Assuming that one man, given the task, was able to throw away one dollar each second and could keep up that pace for 8 hours a day, it would take him 555 years to dispose of the entire sum.

Naturally it is recognized that we cannot wait that long for recovery, but even with three men in charge of the dollar disposal it will be admitted that the job is no small one. Nature sometimes helps out a worthy cause, however, as emphasized by a news item which appeared last week:

Lakewood, N. J.—One of New Jersey's prominent ERA projects—an eighty acre lake—which took two years to make, vanished after its dam broke and 1,000,000 gallons of water flowed into the Meterdeconk River."

More of these self-liquidating projects is what America needs today!

* * *

To be perfectly fair, one must examine the evidence on both sides of a subject. That Nature may not be altogether in cahoots with the Government dollar spenders is hinted by the set back it gave them, also last week, in connection with the bountiful harvest in the prairie states. This made plenty of opportunities for jobs on private payrolls but few takers could be found, recipients of relief preferring to remain sitting on their back porches so that they would be sure to be at home when the R.F.D. postman came with the Government relief check. So several Western states were compelled to suspend the dole in order that workers might be induced to accept private pay.

* * *

The weather is too warm to point a moral, but at least we can draw a conclusion. By working both for and against the pork barrel boys, Nature has at least given evidence of neutrality concerning the New Deal.

J. H. VanDeventer

A Review of Developments in

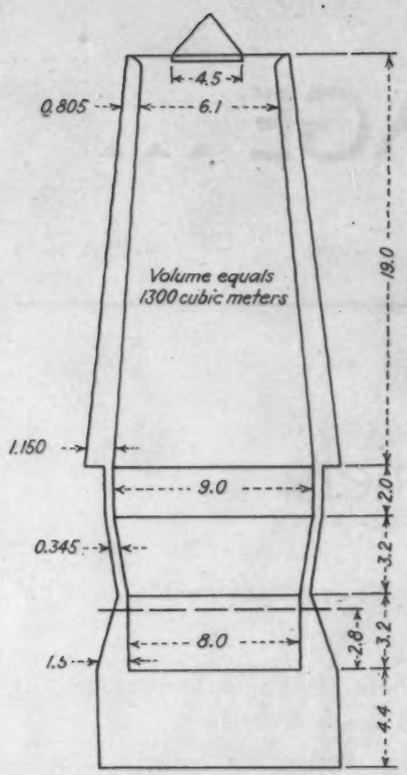


FIG. 1—Section of the second standard blast furnace designed by the Soviets and adopted at the conference of blast furnace engineers at Leningrad in 1934. All measurements are in meters, and the effective volume is 1300 cubic meters.

THE pig iron output of Soviet Russia rose from 4 to 10 million tons in a period of five years. It required 12 years for the United States to achieve this same rise, and England required 45 years. The U.S.S.R. engineers are constructing the largest blast furnaces in the world, and the efficiency of these

PRIOR to the world economic crisis there was a general tendency to increase the volume and daily productivity of blast furnaces. During the last 20 years the productivity of blast furnaces has increased two-fold and in the period from 1914 to 1928 the daily productivity of large-sized American blast furnaces rose from 500 to 750 tons. In the year 1927, according to the information given by Mr. A. G. McKee, blast furnace No. 5 was blown in by Jones & Laughlin Steel Corpn. at the Aliquippa Works in America. This furnace had a hearth diameter of 24 ft. 6 in. (7.47 meters) and an effective volume equal to 943 cubic meters. The daily average productivity of this furnace reached 1006 tons for a whole year, and this high productivity, according to Mr. McKee, was due to the abrupt increase of hearth diameter, which exceeded by 3 feet (0.915 meters) that of the largest hearth built up to that time.

Thus, the year 1927 was the beginning of a new period of development of blast furnace practice and was marked by a transition to a regular daily average productivity equal to 1000 tons.

Following the successful performance of blast furnace No. 5 mentioned above, additional 1000-ton furnaces began to appear in both America and Germany.

Blast furnace No. 3 of the Jones & Laughlin Steel Corpn. was then reconstructed. Its hearth diameter was increased to 8.27 meters and its effective volume thus became 1125 cubic meters. These increases in size resulted in a lift in the daily productivity to 1200 tons.

In Germany in 1928, the daily average production of blast furnace No. 8 of the A. Thyssen firm reached 1100 tons of basic Bes-

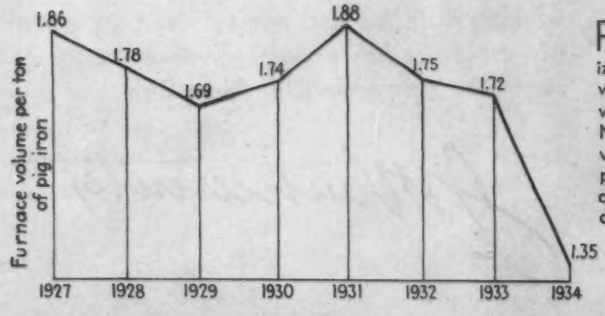


FIG. 2—Average coefficient of utilization of furnace volume for all Soviet blast furnaces. Note how the unit volume per ton of pig iron produced consistently declines during recent years.

Blast Furnace the U. S. S. R.

By B. M. SUSLOV
Metallurgical Engineer, Grosny, U.S.S.R.

furnaces approaches the best American and German practice, despite Russia's lack of ore sintering plants and good qualities of coke. The author herein sketches the growth of Soviet blast furnace practice, presents the current status of the industry and reviews what may be expected in the U.S.S.R.

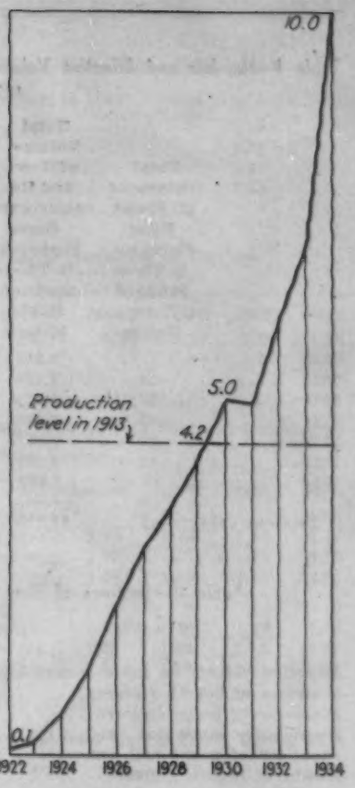


FIG. 4—Total Soviet pig iron production in millions of tons. The output in 1913 is equal to 4.2 million tons. During the revolution the production of pig iron practically ceased.

semer pig iron. This furnace had a hearth diameter of 6.5 meters and a volume of 827 cubic meters. Blast furnace No. 2 of the Dortmund Union firm had a 6-meter diameter hearth and a volume of 870 cubic meters and also possessed a 1100-ton daily productivity. Also blast furnaces No. 7 and No. 8, installed by F. Krupp in Reingausen, each had a volume equal to 830 cubic meters and were capable of producing from 1000 to 1100 tons of basic Bessemer pig iron daily.

The D blast furnace of the Tata Iron & Steel Co. in British India had the highest average daily production, namely, from 1200 to 1400 tons. This furnace had a hearth diameter of 7.47 meters and a volume of 813 cubic meters.

The purpose of mentioning herein the records of some of the largest blast furnaces is to point out the highest daily production of any blast furnaces in the world.

In 1931, due to the world economic crises, further attempts to increase the volume and productivity of blast furnaces were stopped in America. This action came about at even an earlier date in Germany.

U.S.S.R. Rates Doubled

Prior to 1918 the largest coke blast furnace in Russia was capable of producing only 400 tons of pig iron on separate days. However, at the present time there are several furnaces existing in this country with a daily productivity ranging from 800 to 900 tons. Moreover, blast furnaces No. 1 and No. 2 installed at Magnitogorsk Works, Ural District, have shown an average daily productivity equal to 1000 to 1080 tons. These fur-

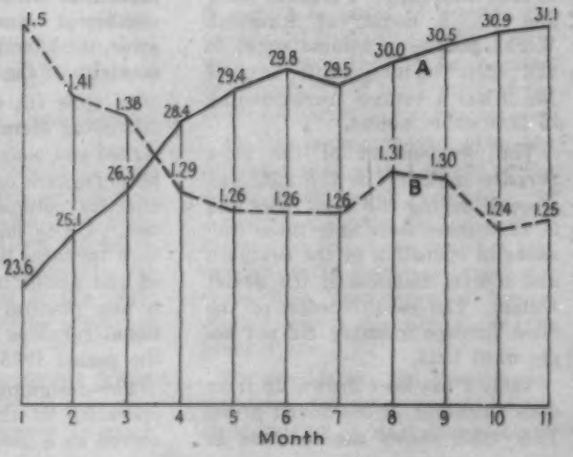


FIG. 3—Showing the average daily production of pig iron (in thousands of tons) of all Soviet blast furnaces for the eleven months of 1934 (curve A). Average furnace volume in cubic meters per ton of pig iron is shown by curve B for the same period.

Table I—Number and Effective Volume of Soviet Blast Furnace During the Period 1928 to 1934

	Total Volume of all Soviet Blast Furnaces in Thousands of Cubic Meters	Total Volume of New and Reconstructed Blast Furnaces in Thousands of Cubic Meters	Number of New and Reconstructed Blast Furnaces Put in Operation			
			Blast Furnaces With Volume Less Than 800 Cubic Meters	Blast Furnaces With Volume More Than 800 Cubic Meters	Blast Furnaces With Volume More Than 1000 Cubic Meters	Total Number of Furnaces
1928	..	1.919	3	..	..	3
1929	23	3.706	11	1	..	12
1930	27	3.277	8	..	..	8
1931	29	2.376	5	1	..	6
1932	37	7.851	5	4	2	11
1933	42	6.114	2	3	2	7
1934	49	5.892	none	5	1	6
Total in 1934.	49	31.135	34	14	5	53

Table II—Sections of First and Second Typical Blast Furnaces

	First Type (1930)	Second Type (1934)
Effective volume in cubic meters	930	1300
Diameter of hearth (meters)	7.00	8.00
Diameter of belly (meters)	7.85	9.00
Diameter at stock line (meters)	5.41	6.10
Diameter of great bell (meters)	3.96	4.50
Height of hearth (meters)	3.06	3.20
Height of air tuyeres (meters)	2.50	2.80
Height of bosh (meters)	3.24	3.20
Height of cylindical belly (meters)	1.86	2.00
Height of conical shaft (meters)	14.72	17.20
Height of cylindrical shaft (meters)	2.92	1.80
Bosh angle	82½ deg.	
Shaft angle	85 deg. 10 min.	
Effective height of furnace (meters)	25.80	27.40
Full height of furnace (meters)	28.50	

The section of the first typical blast furnaces, 1930, was designed for the southern district of U.S.S.R., for use with Krivoy Rog, red hematite iron ores and Donetz coke.

naces have hearths of 7.62 meters and a volume of 1180 cubic meters. Furnace No. 3 located at the same works, with a 1220-cubic meter volume, is capable of producing 1148 to 1200 tons daily. Furnaces No. 1 and No. 2 install at Kuznetzk Works possess a volume equal to 828 cubic meters, while furnace No. 3 has a volume corresponding to 1180 cubic meters.

The development of the blast furnace industry in U.S.S.R. was stopped during the Civil War and in 1923 there were only three furnaces in operation in the southern and central districts of the Soviet Union. The rehabilitation of the blast furnace industry did not begin until 1925.

Table I has been drawn up from data published in the Soviet press. This table shows the increase in the number of furnaces and the total volume of all newly constructed, reconstructed and restored furnaces during the period of 1928 to 1934. Also it may be seen from this table that with the growth of the number of furnaces placed in operation, the effective volume and productivity of the furnaces increased.

In 1930 the State Institute for Designing Metallurgical Plants designed and adopted the first typical blast furnace construction with an effective volume of 930 cubic meters. Up to the present time nine such furnaces have been constructed and placed in operation, and it is now planned to build five additional furnaces of this size during the period 1935 to 1937.

The designing, construction and operation of these furnaces have served as a good training for Soviet blast furnace engineers. It is necessary to note here the importance of construction and exploitation of the first typical furnace in Soviet practice. It enabled the engineers to foresee and eliminate certain defects discovered in its construction during the building of the additional typical furnaces.

The introduction of large-sized furnaces with a volume of 930 cubic meters gave favorable results, as it served to pave the way for the transition to blast furnaces having a volume equal to 1180 cubic meters and an average daily productivity ranging from 1000 to 1100 tons. In addition, the necessary experts for their operation were trained.

Owing to the insufficient supply of high-grade coke required for the operation of such large-sized furnaces, the sudden switching from 400 to 500-ton furnaces to furnaces designed for producing from 1000 to 1200 tons caused many difficulties to arise.

The use of 930-cubic meter furnaces, naturally, made it necessary to improve the production and quality of coke required. Thus the gradual transition to the mastering of larger-sized furnaces was prepared for in advance.

The installation and operation of blast furnaces designed by A. G. McKee Co. at the Magnitogorsk Works, Ural district, and by Freyn Co. at Kuznetzk Works, West Siberia, played an especially important role in the progress of blast furnace practice in the Soviet Union. The operation of these furnaces proved the possibility of constructing blast furnaces with a daily output equal to 1200 tons and more.

Following the successful work of furnaces No. 1 and No. 2, with a volume of 828 cubic meters, furnace No. 3 was installed at Kuznetzk Works. This latter furnace has a volume of 1180 cubic meters.

At the Magnitogorsk Works, the average daily output of furnaces No. 1 and No. 2, with volume equal to 1180 cubic meters, runs as high as 1000 to 1100 tons. Furnace No. 3, with a volume of 1220 cubic meters, reached 1148 to 1200 tons in the course of four months.

The raised output of Magnitogorsk furnace No. 3 is explained by the elimination of defects discovered in furnaces No. 1 and No. 2, namely: (1) The thick-walled bosh

with an American bronze cooling plate system was replaced by a thin brick work (lining) and water cooled cast iron plates, designed for the protection of the steel plate jacket of the bosh. Similar improvements were made in the tuyere zone. (2) The diameter of the furnace belly was increased from 8.380 to 9.00 meters, causing the volume of the furnace to be increased from 1180 to 1220 cubic meters.

Second Typical Blast Furnace

The successful use of typical blast furnaces with volumes running as high as 930 cubic meters and 1180 cubic meters gave occasion to further increase the volume of blast furnaces.

In 1934 the State Institute for Designing Metallurgical Works designed a blast furnace of typical construction having an effective volume of 1300 cubic meters. This design was examined and subsequently adopted at the conference of Soviet blast furnace engineers held in 1934 in Leningrad. The differences between the first typical furnace and the second are shown in Table II. A sketch of the second typical (standard) furnace is shown in Fig. 1.

The thickness of the furnace lining (brick work) was designed as follows: 1.5 meters for the lower part of hearth, 1.15 meters for the lower part of the shaft (stack), 0.805 meters for the upper part of stack (shaft) and 0.345 meters for the bosh and cylindrical belly. Sixteen tuyeres are used, each with a diameter equal to 175 to 225 mm.

In regards to the hot blast Cowper stoves, three for each furnace were found to be sufficient. The surface of each Cowper stove is equal to 20 square meters and the capacity of the Freyn gas burners was as high as 36 cubic meters per hour.

As the Soviet standard air blowers are capable of producing from 3200 to 3400 cubic meters of air per minute, the Soviet blast furnace engineers assume that the new typical furnace will provide an average daily output equal to 1000 tons with a coke consumption less than 1 ton per ton of pig iron, using a charge having an Fe content equal to 41 or 42 per cent. When the Fe content in the charge goes to 44 to 46 per cent, the average daily output should run as high as 1300 to 1400 tons with a coke consumption less than 0.9 per ton of pig iron.

On considering the burning and destruction phenomenon which has been observed in the lining of bosh, belly and shaft of the Magnitogorsk blast furnaces No. 1 and No. 2, the conference previously mentioned found it obligatory to have a shaft brick work made in contact with the steel plate shell of shaft. In addition to this, it was found necessary to provide the bosh with a brick work (lining) 345 mm. thick and a continuous steel plate jacket in order to avoid the burning of brick work noticed in the bosh and lower part of the shaft which was supported by a bracket rim.

For the protection of the jacket of the bosh and belly, it was proposed by the conference to place water-cooled cast iron plates (flat plates with steel tubes for cooling water inserted in them) between the brick work and steel jacket.

It was also found necessary to raise the columns and bracket rim 2 meters in order to provide the cylindrical part of the belly with a wall 345 mm. thick, thus ensuring the durability of brick work of the shaft supported by the bracket rim.

It was acknowledged that the bronze cooling plates placed in the shaft brick work according to American practice did not justify themselves and consequently it was decided in the future to install not more than four rows of bronze cooling plates directly above the bracket rim.

On considering the great transportation difficulties caused by the close spacing of blast furnaces and

Table III—Furnace Volume Per Ton of Daily Productivity of Pig Iron

Name of Plant	Average in 1913	Average in 1933	Average in June, 1934
Stalinsky	2.05	1.33	1.15
Petrovsky	1.93	1.54	1.28
Enakievsky	2.13	1.55	1.29
Frunse	2.03	1.76	1.38

Table IV—Furnace Volume Per Ton of Daily Production of Pig Iron

Type of Furnace	Average in 1933	1934 Jan.	Feb.	March	April	May	June
Soviet coke blast furnace	1.60	1.50	1.41	1.38	1.29	1.26	1.26
Soviet charcoal blast furnace	1.96	1.89	1.87	1.82	1.92	1.76	1.63

Table V—Furnace Volume Per Ton of Daily Productivity of Blast Furnaces Constructed According to American Design

Magnitogorsk Works in 1934	March	April	May	June
Blast furnace No. 1, volume of 1180 cubic meters	...	...	...	1.28
Blast furnace No. 2, volume of 1180 cubic meters	1.80	1.14	1.09	1.34
Blast furnace No. 3, volume of 1220 cubic meters	1.15	1.11	1.04	1.27
Blast furnace No. 4, volume of 1176 cubic meters	1.09	1.04	1.08	1.15
Kuznetzk Works in 1934				
Blast furnace No. 1, volume of 828 cubic meters	1.36	1.26	1.09	1.11
Blast furnace No. 2, volume of 828 cubic meters	1.39	1.40	1.12	1.08
Blast furnace No. 3, volume of 1180 cubic meters	1.39	1.37	1.09	1.07

Table VI—Average Hot Idle Time of Soviet Blast Furnaces (in Per Cent) During 1934

	Jan.	Feb.	March	April	May
Coke blast furnaces	5.85	4.73	5.28	4.37	3.65
Charcoal blast furnaces	3.01	1.87	2.04	3.66	6.43

Table VII—Consumption of Coke Per Ton of Pig Iron Produced

	Average in 1933	Average in June, 1934
Magnitogorsk Works	0.953	0.920
Makeevsky Works	1.130	0.966
Stalinsky Works	1.212	1.079
Asovsteel Works	1.107	1.001

straight-line layout of the furnaces (for example, Magnitogorsk Works A. G. McKee Co. design, and Kuznetzk Works A. Freyn Co. design), it was concluded by the conference that the furnaces should be spaced 120 to 125 meters apart. In relation to the layout of the blast furnace plant, it was also decided that it should be analogous to that existing at the American plant at Gary of the Illinois Steel Co. Such a layout was recognized to be more convenient for furnace operation, and in addition to this it permits the construction of new furnaces without disturbing the operation of old ones.

Effective Volume Utilized

The coefficient of utilization of the effective volume of blast furnaces is, in other words, the furnace volume per ton of daily productivity, i.e., a value reversible to daily productivity per unit of furnace volume. Along with the development of volume and productivity of Soviet blast furnaces, there has been an improvement carried out for the utilization of effective volume of the latter, and it is of interest to point out the progress reached in this respect at the present time by some Soviet iron works in comparison with the pre-war period. Table III shows the great improvement in utilization in furnace volume since the revolution, and the more recent improvement in the average monthly coefficient of utilization of furnace volume for all coke and charcoal furnaces is presented in Table IV.

It is necessary to note here that during the pre-war time in Russia, none of the furnaces using coke blast ever possessed such a coefficient of utilization of furnace volume as the average value for coke blast furnaces reached in May-June, 1934, that is, 1.26.

The yearly change in average coefficient of utilization of furnace volume for all blast furnaces existing in the Soviet Union is shown in Fig. 2. It may be observed from the diagram how this value keeps systematically decreasing with the years and finally reaches 1.35 in 1934.

The change of average coefficient of utilization of furnace volume and daily production of pig iron (average per month) in the Soviet Union in 1934 are shown in Fig. 3. In June, 1934, the average monthly utilization coefficient of all the iron works in the Soviet Union varied from 1.08 to 2.01.

The operation of the blast furnaces located at the Magnitogorsk and Kuznetzk works, constructed according to American design, offers special interest in this respect. The data on these operations are shown in Table V.

It is necessary to note that both of the above-mentioned iron works are operating on easily reducible Magnitogorsk iron ore and on Kuznetzk coke which has a sulfur content equal to about 0.5 per cent. The data in Tables III to VI are based on the data published in *Soviet Metallurgy*, No. 7, 1934.

In several of the best months of the first half year of 1934 the coefficient of utilization of several of the Soviet blast furnaces reached 1.04, which is considered to be the usual average value for large American furnaces.

There were many furnaces where this value reached 1.11 to 1.13 without any preliminary preparation of iron ores, while in the southern district of the U.S.S.R. the ore loss in flue dust reached 20 per cent and often 30 per cent and more. In the future, after having switched to screened and sintered iron ores, the utilization of furnace volume of many Soviet furnaces should be greatly improved.

It is interesting to note here that the lowest coefficient of utilization of furnace volume for large furnaces reaches 0.873 (usually an average coefficient of 1.05) in American practice and 0.75 in Germany.

According to the data given above, the coefficient of utilization of furnace volume in the U.S.S.R. is somewhat higher than that existing in America and Germany. At the same time it must be taken into consideration, on examining the utilization of volume of Soviet furnaces, that the natural conditions of blast furnace smelting differ from those in America; namely, the coke obtained in the southern parts of the U.S.S.R. (Donetz coke) contains a much larger quantity of ash (10 to 15 per cent) and sulfur (1.5 to 2.5 per cent) than that used in America. In such cases, to reduce the sulfur content in pig iron the blast furnace process must be carried out on high basic and refractory slags with a high melting point and content of CaO+MgO varying from 48 to 51 per cent. Meanwhile, the American slags are less basic and have a lower melting point.

It is known that highly basic slags may cause an irregular operation of furnace and scaffold the furnace hearth, demanding a higher coke consumption.

The second circumstance causing difficulties to arise in the work of Soviet blast furnaces is the fineness of Krivoy Rog iron ores, especially rich ores mined in the southern district of the Soviet Union which have a high content of SiO_2 (especially in poorer iron ores). Krivoy Rog, red hematite iron ores, are mined with a content of Fe of about 56 to 66 per cent and SiO_2 of 4 to 18 per cent.

The average characteristic of these iron ores is as follows: The quantity of fines (lumps from 0 to 5 mm.) ranges from 10 to 70 per cent; the average is 55 to 65 per cent. Due to the great quantity of fines in these ores there is a considerable loss of ore in flue dust. Usually this quantity is not less than 20 per cent and it often reaches 30 per cent and sometimes more.

Up to 1935 there was only one ore sintering plant existing in the Soviet Union, namely, the Dwight Lloyd system located at the Kerch iron works. In 1935 a new sintering plant was completed with a capacity of 2000 tons daily at the Kerch Iron Works and another plant with a capacity of 1000 tons daily at Makeevsky Iron Works.

Thus, the fineness of ore and lack of screening and sintering of the latter has handicapped the more intensive utilization of furnace volume.

It is proposed to place additional large ore sintering plants in operation in 1935 and in the following years, and to sinter 60 per cent of the total Krivoy Rog iron ore charged into blast furnaces.

Pig Iron Production

In 1934 the total Soviet production of pig iron corresponded to 10,500,000 metric tons, which is twice as much as that produced in 1930. The growth of pig iron production in the U.S.S.R. is more clearly demonstrated in Fig. 4.

The great growth of pig iron production was achieved not only by introducing large-sized blast furnaces but by considerably improving the work of reconstructed

and restored old blast furnaces. This may be seen from Figs. 2 and 3, which depict the decrease in average coefficient of utilization of volume of all Soviet blast furnaces during the period from 1928 to 1934.

During the time of the first Five-Year Plan a radical reconstruction

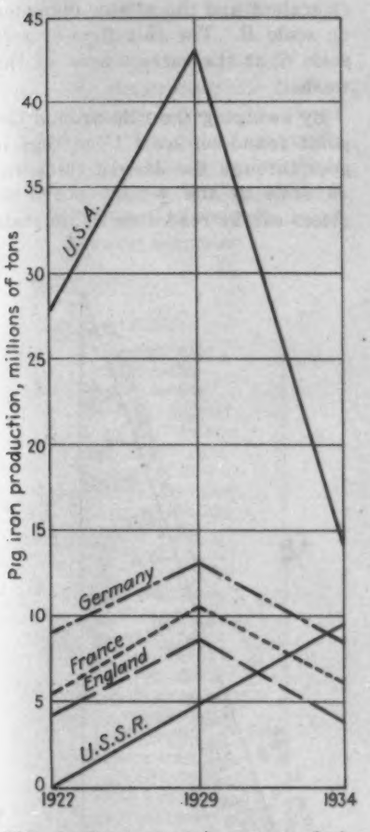


FIG. 5—Total pig iron output of the world's leading producers. Note the drastic drop in American production and the consistent rise in U.S.S.R. production.

of all old blast furnaces in the Soviet Union was accomplished. The reconstruction consisted in the following:

Installation of new turbo blowers with a capacity of 1500 to 3100 cubic meters per minute.

Equipping of many old blast furnaces with modern devices for charging raw material in the furnace top.

Installation of the first casting machine for pig iron in 1931. During the following three years 32 more pig casting machines were manufactured and installed. Over 75 per cent of the pig iron is now cast by means of casting machines.

Almost all of the furnaces with a volume exceeding 400 cubic meters have been equipped with ladles of higher capacity for transportation of pig iron and slag.

Reconstruction of storing places for raw material (ore and coke).

Improvement of quality of coke. Improvement in the organization of labor and qualification of all the working staff engaged at blast furnace plants.

An investment of large amounts of money in the blast furnace industry.

All of the above-mentioned factors served as a basis for the considerable growth of pig iron production. Up to the present time such effective means for improving the operation and production of furnaces, such as sintering of iron ore, have not been fully introduced.

It may be seen from Fig. 5 that in 1934 the Soviet Union came second in the world pig iron production, greatly surpassing its pre-war production, which was equal to 4,200,000 tons in 1913. According to the State plan, 12,500,000 tons of pig iron are to be produced in 1935 and 16,000,000 tons in 1937.

It is interesting to note that the growth of pig iron production in the limits of 4,000,000 to 10,000,000 tons (metric) has been reached in the U.S.S.R. during the period 1929 to 1934 (5 years), in the U.S.A. during the period 1885 to 1897 (12 years), in Germany during the period 1896 to 1905 (15 years), in France during the period 1910 to 1928 (18 years), and in England during the period 1865 to 1910 (45 years).

In spite of the great increase in production of pig iron and steel, the Soviet national economy is still greatly in need of metal. In 1934 the yearly consumption of metal per every one man of population was approximately 78 kg., whereas in 1929 the corresponding consumption in U.S.A. reached about 518 kg., 240 kg. in Germany, and, 235 kg. in France.

Although the world economic crisis decreased the consumption of metals in these industrial countries, the Soviet Union still is far behind in average consumption of metal. In view of this, a still greater development of pig iron production is to be expected in the Soviet Union in the future.

The data in Table VI show that the hot idle time of Soviet blast furnaces is considerably more than that of American blast furnaces. In June, 1934, the hot idle time of all Soviet blast furnaces varied from 0.14 to 16.18 per cent, in relation to the calendar time. The consumption of coke per ton of iron produced at various steel works is shown in Table VII.

In this brief article the author has described only some facts on the recent progress made in Soviet blast furnace practice and had no intention to give complete information on this question.

Wire Men Formulate Attractive Program

THE Wire Association will hold its 1935 meeting and exhibition in conjunction with the National Metal Congress in Chicago, Sept. 30 to Oct. 4 inclusive. Headquarters of the association will be at the Congress Hotel.

Registration, annual meeting and directors' meeting will be held on Sept. 30. The subsequent sessions will consist of technical meetings open to the public and two special meetings restricted to association members. An informal dinner will be held on Oct. 2.

Among the papers and addresses to be presented at the technical sessions will be the following, according to an announcement from the program committee:

"Acid Cleaning and Material Handling of Rods and Wire," by Frederick A. Westphal, superintendent, wire mill, Sheffield Steel Co., Kansas City, Mo.

"Grain Size and Its Influence on the Manufacture of Steel Wire," by B. L. McCarthy, metallurgist, Wickwire-Spencer Steel Co., Buffalo, N. Y.

"Industrial Relations as Applied to the Wire Industry," by E. W. Kempton, director of industrial relations, American Steel & Wire Co., Cleveland, Ohio.

"Cold Heading Wire," by L. D. Seymour, metallurgist, Youngstown Sheet & Tube Co., Youngstown, Ohio.

"Tests and Testing," by C. A. Kellogg, metallurgist, Continental Steel Corpn., Kokomo, Ind.

"Modern Acid Handling Methods Lower Pickling Costs," by J. R. Hoover, assistant manager, Chemical Sales Division, The B. F. Goodrich Co., Akron, Ohio.

"The Effect of Grain Size on the Physical Properties of Copper in Drawing and Annealing," by Dr. L. B. Barker, S. M., metallographer, General Electric Research Laboratories, and A. E. Bailey, in charge of testing laboratory, Wire Dept., General Electric Co., Schenectady, N. Y.

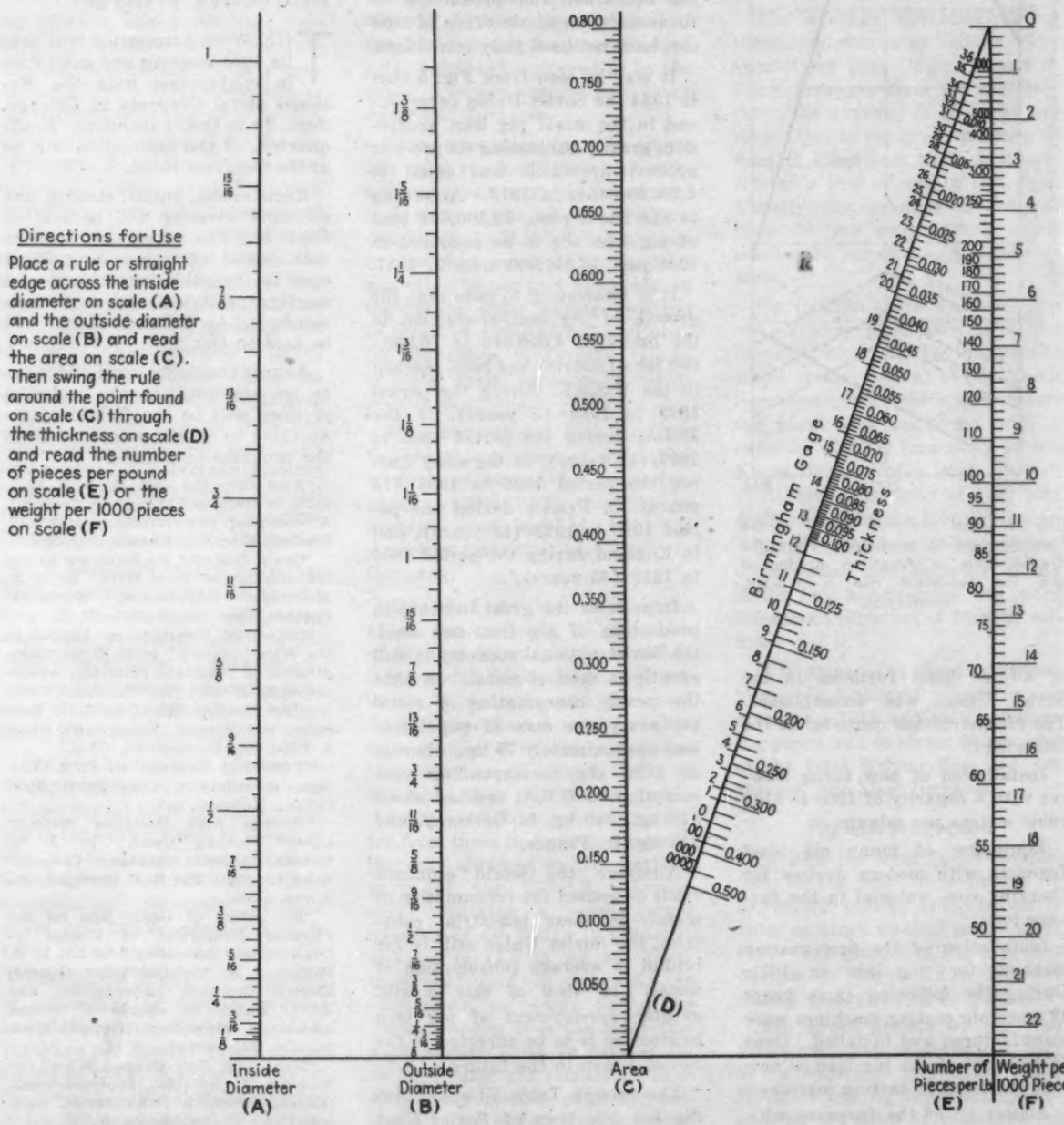
"Hard and Soft Copper Wire," by Rudolph A. Schatzel, superintendent, General Research Laboratories, General Cable Corpn., Rome, N. Y.

Charts Facilitate Determining Weights

IN any estimate of costs of machinery or parts, one of the most complicated calculations is determining the weight of the washers and disks involved. The area of the hole must be found by squaring the radius and multiplying by 3.14159. This must be subtracted from the area of the blank washer without a hole formed in the same manner. After multiplying the result by the thickness and then by the weight of steel per cubic inch, the weight per thousand pieces. Finding the reciprocal of this figure gives the number of pieces is obtained per pound.

All of these calculations can be determined instantly by means of the charts shown herewith. A rule is placed across the inside diameter on scale *A* and the outside diameter on scale *B*. The rule then crosses scale *C* at the correct area of the washer.

By swinging the rule around the point found on scale *C* so that it goes through the desired thickness on scale *D* the weight per 1000 pieces can be read directly on scale


Directions for Use
Place a rule or straight edge across the inside diameter on scale (A) and the outside diameter on scale (B) and read the area on scale (C). Then swing the rule around the point found on scale (C) through the thickness on scale (D) and read the number of pieces per pound on scale (E) or the weight per 1000 pieces on scale (F)
Inside Diameter (A)
Outside Diameter (B)
Area (C)
(D)
Birmingham Gage Thickness
Number of Pieces per Lb. (E)
Weight per 1000 Pieces (F)

# of Washers and Disks

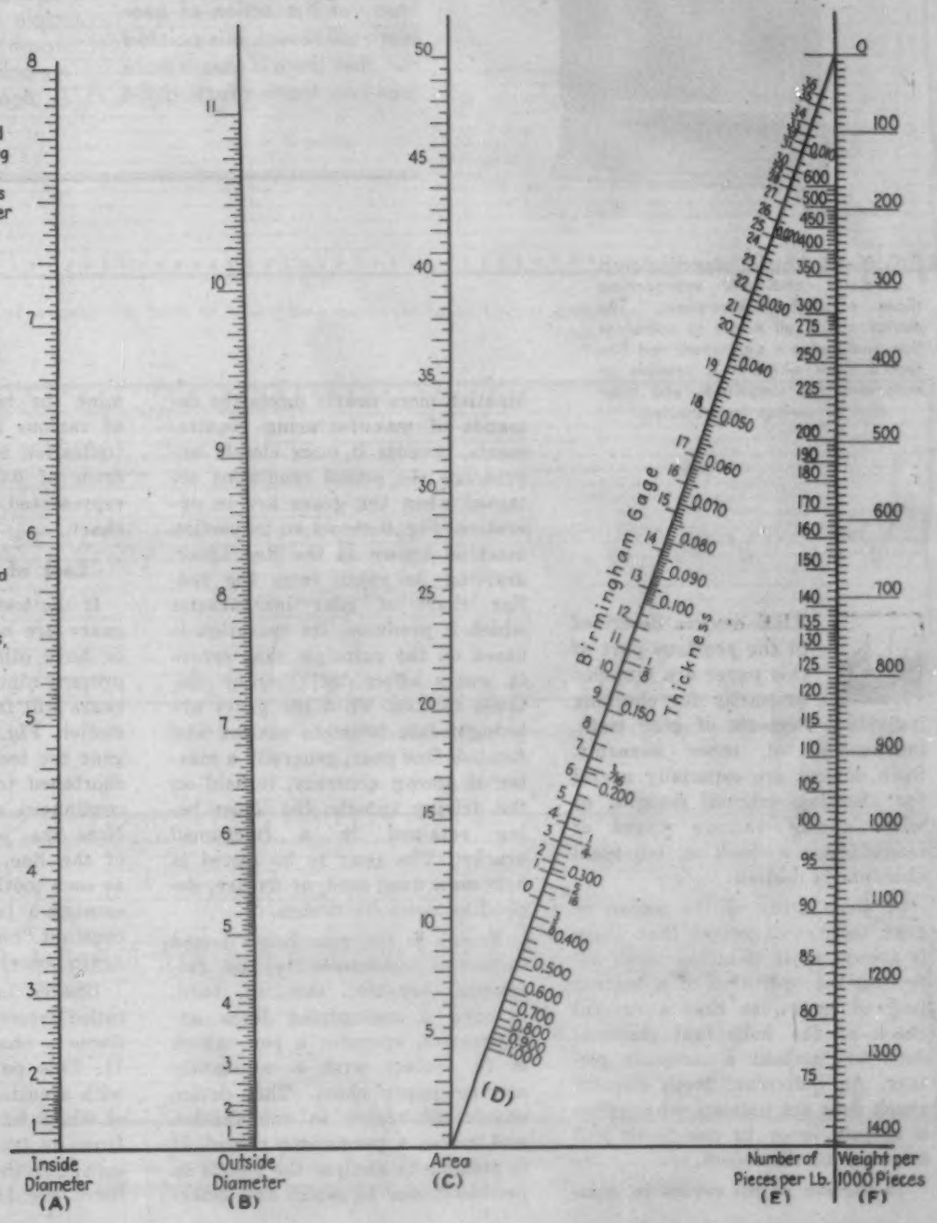
By EUGENE CALDWELL
General Manager, Wrought Washer Mfg. Co., Milwaukee

F and the number of pieces per 100 lb. on scale *E*.

The charts can be constructed within any range desired. One of those reproduced herewith covers washers of the sizes ordinarily dealt with in actual practice, while the other gives more accurate readings for the smaller washers, below 1½ in. outside diameter.

The figures shown are in inches, but if scales *A* and *B* are read in feet, scale *C* will be in square feet, and the values of scale *F* should be multiplied by 144 and of scale *E* should be divided by 144.

Either of the charts can be used for larger or smaller washers and disks than those shown. For example, 10 on scales *A* and *B* can be considered as 1, 9 as 0.9, etc. This requires that two decimal places be pointed off on scales *C* and *F* and two ciphers added to scale *E*. In like manner for larger washers 10 on scales *A* and *B* can be considered 100, 9 as 90, etc. This requires that two ciphers be added to scales *C* and *F* and two decimal places pointed off on scale *E*.


Directions for Use
Place a rule or straight edge across the inside diameter on scale (A) and the outside diameter on scale (B) and read the area on scale (C). Then swing the rule around the point found on scale (C) through the thickness on scale (D) and read the number of pieces in 100 pounds on scale (E) or the weight per 1000 pieces on scale (F)
For more accurate calculations of washers of small diameters, 10 on scales (A) and (B) can be considered as 1, 9 as 0.9, etc. This requires that two decimal places be pointed off on scales (C) and (F) and two ciphers added to scale (E). In like manner for larger washers 10 on scales (A) and (B) can be considered as 100, 9 as 90, etc This requires that two ciphers be added to scales (C) and (F) and two decimal places pointed off on scale (E)
All figures shown are in inches, but if scales (A) and (B) are read in feet, scale (C) will be in square feet and the values of scale (F) should be multiplied by 144 and of scale (E) should be divided by 144
Birmingham Gage
Thickness
(D)
Inside Diameter (A)
Outside Diameter (B)
Area (C)
Number of Pieces per Lb. (E)
Weight per 1000 Pieces (F)

Methods for

FIG. 9—Machine for inspecting gears under conditions approaching those of actual operation. The device charts all errors in combination and makes a permanent red line record, from which it is possible to determine the magnitude and location of various inaccuracies.

A METHOD of checking gear tooth errors in combination rather than separately is described in this abstract of the authors' paper, continued from THE IRON AGE of July 18. Study of the action of gear teeth will reveal, it is pointed out, that there is always more than one tooth affecting the operation of a pair of mating gears; and an individual tooth element check does not indicate what effect a certain error in one tooth will have on another tooth. Operation of the machine described is based on the principle that errors in gear tooth elements cause either velocity changes or variations in center distance.

THE devices described in the previous part of this paper are intended primarily for checking individual elements of gear teeth, independent of other elements. Such devices are especially useful for checking original designs, or when during various stages of manufacture a check on individual elements is desired.

A close study of the action of gear teeth will reveal that there is always more than one tooth affecting the operation of a mating pair of gears, so that a careful check of the individual elements does not present a complete picture. An individual tooth element check does not indicate what effect a certain error in one tooth will have on another tooth.

Inspection of all errors in combination more nearly meets the demands of manufacturing requirements, because it more closely approaches the actual conditions obtained when the gears are in operation. Fig. 9 shows an inspection machine known as the Red Liner, deriving its name from the red-line chart of gear inaccuracies which it produces. Its operation is based on the principle that errors in gears affect their center distance relation when the gears are brought into intimate contact and rotated. One gear, generally a master of known accuracy, is held on the driving spindle, the latter being retained in a fulcrumed bracket. The gear to be tested is held on a fixed stud, or fixture, depending upon its design.

Errors in the gear being tested impart a movement to the fulcrumed bracket; this in turn, through a multiplying lever arrangement, operates a pen, which is in contact with a constantly moving paper chart. This device charts all errors in combination and makes a permanent record. It is possible to analyze the charts so produced, and to detect and determine the magnitude and location of various inaccuracies. The multiplication is 200 to 1, so that an error of 0.001 in. in the gear is represented as 0.200 in. on the chart.

Lack of Continuous Action

If the teeth of a pair of mating gears are not of sufficient length, or have other defects, which will prevent continuous action, then the gears will fail to transmit uniform motion. Fig. 10 shows a chart of a gear the teeth of which have been shortened to such an extent that continuous action is not obtained. Note the peculiar characteristics of the line. Action is interrupted as each tooth passes through mesh, causing a jagged peak and then a constant "building up" until action again ceases.

Uneven tooth spacing, generally called errors in circular pitch, produces a characteristic chart, Fig. 11. This particular gear was cut with a cutter, each alternate tooth of which was purposely ground off from its true spacing position, resulting in the line shown. Note that there are 16 jagged peaks, equal

Checking Gears—II

By DOUGLAS T. HAMILTON
and ROBERT BEARDSLEY

to one-half the number of teeth in the gear.

Variations in Pressure Angle

Fig. 12 shows a chart of a gear which varies in pressure angle from the master against which it was compared. Here we have 32 jagged peaks equal to the number of teeth in the gear. This error was purposely exaggerated, making the "peaks" higher and sharper than would normally be the case with slight errors in pressure angle. Slight errors in pressure angle produce a chart somewhat similar to a line curve.

Lack of concentricity of the pitch circle is a common error which the Red Liner clearly records. Fig. 13 shows a chart of a gear purposely

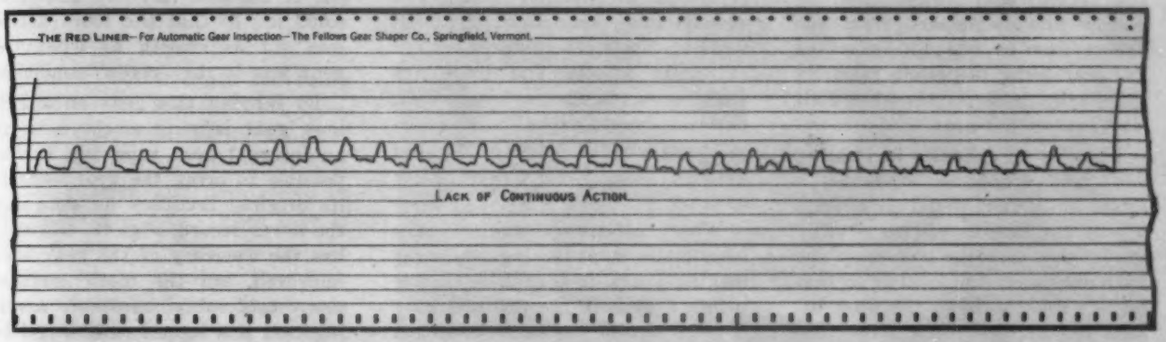


FIG. 10—Chart of a gear the teeth of which have been shortened so that continuous action is not obtained.

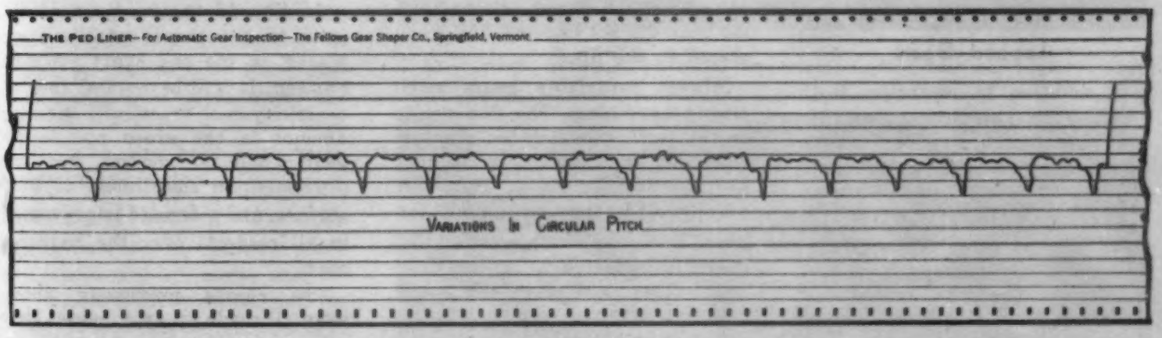

THE RED LINER—For Automatic Gear Inspection—The Fellows Gear Shaper Co., Springfield, Vermont
VARIATIONS IN CIRCULAR PITCH

FIG. 11—Characteristic chart produced by uneven spacing.

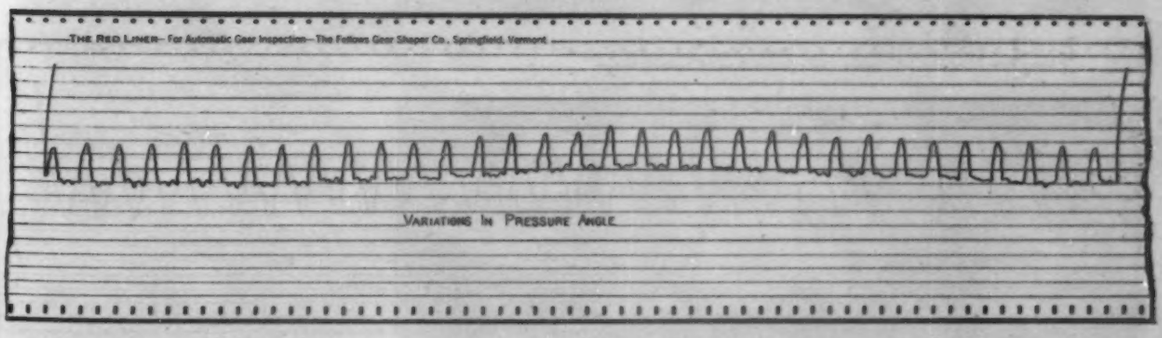

THE RED LINER—For Automatic Gear Inspection—The Fellows Gear Shaper Co., Springfield, Vermont
VARIATIONS IN PRESSURE ANGLE

FIG. 12—Chart of a gear that varies in pressure angle from the master against which it was compared. The error was purposely exaggerated, the peaks being higher and sharper than normally.

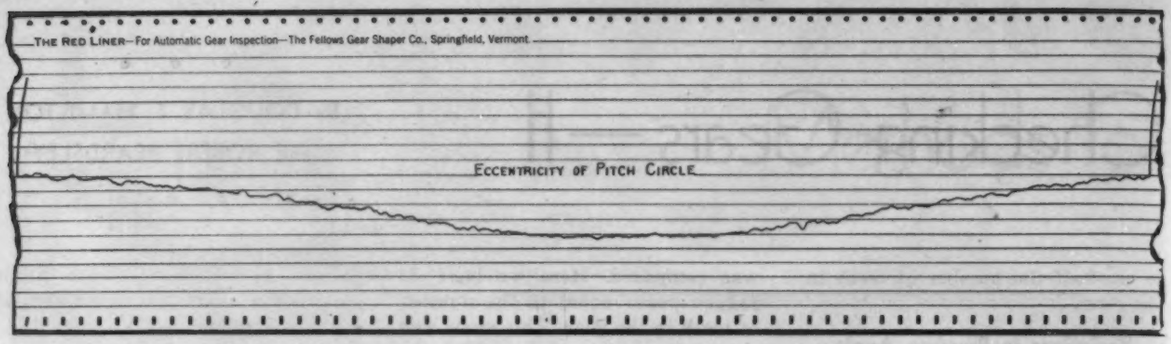

THE RED LINER—For Automatic Gear Inspection—The Fellows Gear Shaper Co., Springfield, Vermont
ECCENTRICITY OF PITCH CIRCLE

FIG. 13—Chart of gear cut about 0.004 in. eccentric.

cut about 0.004 in. eccentric. Note that eccentricity causes the recorded line to depart from the datum line in one revolution of the gear being inspected, reaching the maximum deviation when half way around the gear.

There is no difficulty in locating fillet interference, as it causes a series of abrupt departures from a straight line as shown in Fig. 14. In this case the cut gear was purposely made too shallow so that contact took place in the fillet before the profiles could come into intimate contact, causing the gears to alternately come together and spread apart.

Charts of Cut, Hardened and Lapped Gears

In addition to recording tooth errors, the inspection machine shown in Fig. 9 also presents an accurate picture of the condition of the contacting tooth surfaces. Fig. 15 shows three charts of the same gear in three different conditions, namely, "green," hardened, and lapped. The upper record is of the green gear, which was cut on the gear shaper without any particular pains taken to obtain extreme accuracy; in fact this would represent an average gear. The accumulative error does not exceed 0.001 in. The tooth surfaces are not extremely smooth and there are slight errors in circular pitch. This, however, would prove to be a satisfactory gear if it could be used without being heat treated after cutting.

While extensive studies have been made in producing steels for making gears, it is still impossible to put a gear in the fire and have it come out in the same condition that it went in. Distortion, although in some cases slight, still takes place, and as the second record on Fig. 15 shows, this particular gear did not improve any when placed in the fire.

Almost invariably gears swell during hardening. The two points on the teeth at which the greatest distortion takes place is in the fillet and top of the booth. The fillet usually rises and the top of the tooth thickens, which on the Red Liner is indicated as a combined interference and pressure angle variation error.

Before this particular gear was put in the fire, the accumulative error was 0.001 in. When it came out of the fire, this had grown to 0.003 in., so that the tooth action was not as smooth as when the gear was in the "green" condition.

By lapping this gear on a Fellows gear lapping machine, using an internal gear type lap, it was possible to bring the gear back to its original accuracy as shown in the lower record, Fig. 15. Not only has the accuracy of the gear been improved, but the tooth surfaces are considerably smoother, assuring that this lapped gear would be quieter in operation than would be the case with the "green" or hardened gears.

In Fig. 15 the readings of this gear in the three conditions are placed on the one chart for comparison. It will be noticed that eccentricity is of practically the same amount in the green and lapped gear. There is, however, some improvement in smoothness of tooth surface, and a decided improvement in all respects over the hardened gear.

The charts previously shown were all made on spur gears. Helical gears if properly cut and

(CONTINUED ON PAGE 94)

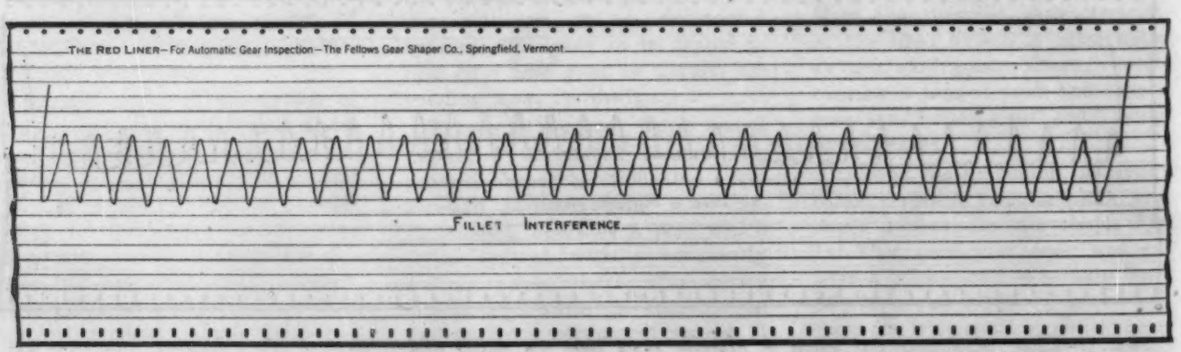


FIG. 14—Fillet interference causes a series of abrupt departures from a straight line, as shown in this chart.

Pressed Steel Boats Made Without Ribs, Stem Or Stern Posts

PRESSED steel boats are being constructed without keel, ribs, stem or stern posts by the Gil-Boat Co., Holland, Mich. Sheets are first cut to pattern and then rolled in the form of a tube. Each tube is then broken in three places, the center break forming the keel. These formed sheets are again matched to a pattern and the bow, also cut to pattern, is welded in place. The stern is assembled in the same manner. The three seats are air tanks and therefore the boat is practically unsinkable. It should be noticed that these seat tanks, welded in place, form the only ribs or bracing in the boat. Speed boats are built with three curves on the bottom.

An 11-ft. boat of this type weighs only 84 lb. It will plane easily with a 3-hp. motor and attain a speed of 22 miles per hr. Other sizes of this design, equipped with a 16-hp. motor will attain speeds of from 40 to 50 miles per hr.

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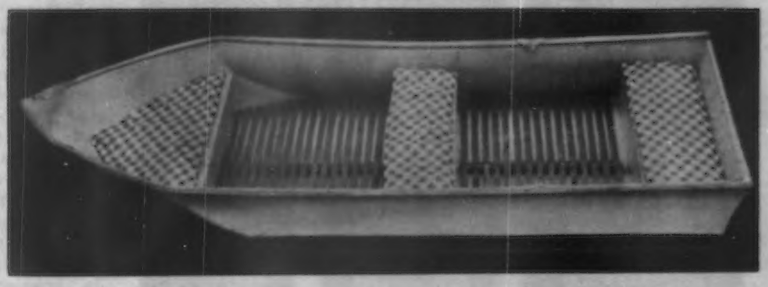
The sheets are first rolled to cylindrical form.

Each cylinder is broken in three places to form keel and bilge.

Bow, stern, and tank seats are welded in place.



An 11-ft. boat, complete, weighs only 84 lb.

Late Returns from Laboratory And Mill

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By T. W. LIPPERT
The Iron Age, New York

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AMONG new developments noted this week by the author is a method worked out in this country for testing the homogeneity of steel balls electrically.

English experience in using aluminum in the evaporation process of producing mirrors is cited, as is a new method developed for jointing aluminum which is similar to soldering.

The results of German experiments on nickel-aluminum magnet steel and, also, the development of a plating bath to produce an absolute black chromium plate are other highlights recorded.

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Dead Black Chromium Plate

BRIGHT nickel has already won a prominent place in the plating industry, finding particular application in various types of consumer products and as a decorative motif for modern offices and furniture. Of equal importance for the same purposes is the development of black chromium plate having a finish similar to gun metal, i.e., alloys which imitate the nearly black tarnish of copper-alloy gun metal.

Of additional interest to the plating industry are the new types of chromium plate which have an "absolute black body" finish. A solution producing this type of surface is described by H. Pollack in a recent issue of *Chemiker Zeitung*. The electrolyte calls for 0.52 to 0.83 lb. per qt. of chromic acid and 0.8 to 1.2 per cent of acetic acid, but no sulphuric acid. The bath is operated at more than 67 amp. per sq. in., and is kept at below 15 deg. C. by a system of water cooling. The black plate can be applied directly on to steel or iron or on an intermediate coat of bright chromium plate. If the undercoat is of nickel plate, it must be free from occluded hydrogen and from internal stress in order to secure satisfactory black plate results.

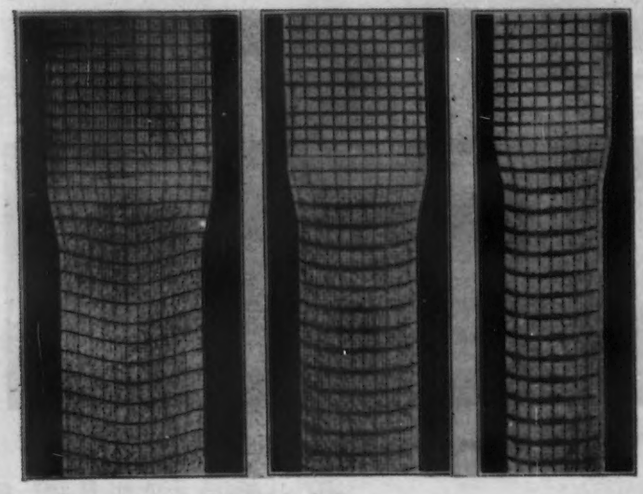

FIG. 1—Deformation of copper wire during successive drafts through a die. From left to right, the rod has been reduced in three draws from 1 in. to 0.57 in. in diameter or about 30 per cent reduction in each case. Die opening was about 24 deg.

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Wire Deformation During Drawing

SEVERAL years ago Taylor and Quinney (English) investigated the deformation of wire during drawing by dividing copper wires longitudinally and scratching a network of lines on the inner surfaces; the two halves were then put together again and carefully drawn through a die. A study of the lines, following drafts of various amounts, gave an indication of the displacement of the wire particles during drawing. This work was mostly a confirmation of a previous investigation on copper rods by the German, E. Siebel. The work of the Englishmen, however, had one defect in that the wires were drawn back through the dies, thereby deforming the drawn part to a degree.

E. Siebel has just issued a report on a study of wire deformation to supplement his study of changes occurring in a rod. Instead of using a solid die, he uses a split die, thereby facilitating the removal of the wire at any time

for examination. A network of lines were scratched on the inner surface of the wires by means of a razor blade, as in previous experiments. The appearance of these lines, following successive reductions of 30 per cent, is shown in Fig. 1.

It is apparent that the distortion of the cross-section rapidly diminishes with successive draws, and finally the changes of shape are merely due to the lateral contraction and longitudinal extension, with an entire absence of shearing strain. Siebel suggests that the decrease in displacement of the outer zone of the wire with successive drafts can be attributed to the different degrees of work-hardening in the outer zone and the core; in consequence, contrary to the case of a mechanically homogeneous material, the outer zone offers greater resistance to the subsequent displacements during the following drafts. In his study of the deformation of the scribed lines, Siebel has determined the principal direction of deformation in wire during drawing.

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Jointing Aluminum Alloys

A NEW method of jointing aluminum alloys without the danger of injury to the metal involved in welding processes has just been announced; it is said to be quite simple and is analogous to soldering, except that no flux of any kind is required. The material used in the process is known as Alusol, and it will join aluminum in cast, rolled, sheet, or tube form, as well as Hiduminium, Duralumin, or Birmabright, with a strength equal to that of the unjointed material. It is claimed that Alusol withstands corrosion as the result of a process used in its manufacture, and is not affected by aging. It is also understood that an aluminum tube can be fastened on to a steel bracket by this process, if the steel bracket surface is first tinned with soft solder; such a joint will stand a pull of approximately 6 tons per sq. in.

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Test Internal Structure of Bearing Balls

ADDED uniformity of ball bearings has recently been made possible by a unique electrical testing unit which reveals internal defects and gives an indication of the microstructure of the steel without injury to the surface of the ball itself. This equipment, shown in Fig. 2, is in operation at the plant of the Fafnir Bearing Co.

FIG. 2—Testing the internal structure of steel balls magnetically. The operator is placing a ball in a V-shaped notch where it forms one arm of Wheatstone bridge. An unbalanced bridge indicates internal flaws.

Balls to be tested are simply rotated on two small electrical contacts in the V-shaped notch shown in front of the operator. A light beam moving over a ground-glass scale reveals whether or not the balls come within previously determined standards.

A balance of inductances between three known values and the ball to be tested, similar in principle to the balance of resistances obtained with a Wheatstone bridge, provides the basis of the test. Since the balls have been previously checked for size to within limits of 0.00005 to 0.0001 in., settings are made on the basis of constant mass for each size of ball.

Experiments have shown that internal flaws, soft centers, excessive decarburization and other variations in microstructure all result in definite changes in the readings obtained. Since hardness also depends upon microstructure, the electrical measurements give an indirect check on this factor as well. Correlation of the results obtained with metallographic examination, hardness tests and the like provides standards for production tests.

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Nickel-Aluminum Magnet Steel Investigated

A RECENT report in the *Archiv für das Eisenhüttenwesen* presented data on a number of experiments performed on sand-cast nickel-aluminum magnet steels. Samples of such thickness that the cooling rate is the most favorable show maximum values for coercive force and remanence. Heavier thicknesses may be used without a decrease in the coercive force if the aluminum content is increased from 12 to 18 per cent. The increase of aluminum content has little effect on either the remanence or maximum induction.

The report states that the nickel content is best kept at about 25 per cent, and only when increased remanence is required should the content be permitted to drop to 22 per cent. Deficient coercive force and remanence in thick-sectioned magnets can best be increased by heating to 1100 deg. and then cooling in air. The properties of thin-sectioned magnets, however, are improved by tempering at 700 deg. for from 2 to 5 hr. Water quenching and tempering are recommended when a coercive force of 250 to 350 oersted and the highest possible remanence are desired. No method of heat treatment will give simultaneously the maximum values of coercive force and remanence corresponding to correct cooling conditions after casting. Therefore, it is advisable to adopt in the beginning the most suitable dimensions for the castings by giving attention to the design. Also it was found that carbon has much less influence on the magnetic properties than had previously been believed.

Steel Lookout Towers

Modern standard steel lookout tower in the Cloquet forest experiment station, Carlton County, Minn.

STEEL lookout towers have been standardized by the Government and many will be added to those now in use in a nation-wide campaign to reduce forest fires. Conservation of our wood supply is an important but minor motive. Floods, droughts, erosion and dust storms have brought home to the American people with dramatic force the imperative necessity of protecting our forests from further destruction.

ALL timber resources of the United States are being drawn into a closely-knit system of forest protection, as a vital part of the attempt to save the nation's watersheds from irretrievable erosion damage. Based on recent tests and experience in the great Western forests, a system of high steel lookout towers is now being extended not only in the National forests, but through State, County and even private forests.

Realizing that all efforts to prevent or ameliorate the dust and water erosion must prove fruitless if present watersheds are not thoroughly protected—and, in fact, extended over burned and lumbered areas—the cooperation of all owners of important forest lands, both governmental and private, has been obtained in 39 States, and standard specifications for suitable steel towers have been distributed by the Forest Service, United States Department of Agriculture.

Citizens Conservation Corps labor, combined with local metal artisans in many communities, is already at work on some of the towers, and it is hoped that by the end of 1936 several hundred of the new type of towers will have been added to supplement the 3000 odd towers of all kinds already functioning.

In specifications now in use in the California, Oregon and Washington forests, certain items are described, for reasons of clarity, with the name of a standard manufacturer, but it is made clear, too, that all responsible manufacturers may bid on the items, and that there is no bidding prejudice in the use of such descriptive nomenclature.

Towers Have Maximum Height of 120 Ft.

The greatest height of the new steel towers has been set at 120 ft., but sections may be deleted to meet the requirements of specific locations. A tower on a mountain top, for instance, can be constructed with a section or two, while one on a plain or in a valley, may have to reach the ultimate 120 ft.

Experience in the great forest fires of 1934, in which 19 men lost their lives on the various fronts, revealed that as the extremely hot air from a great fire rushes upward, cold air from aloft pushes into the vortex at velocities reaching 115 miles an hour. Hence, the new towers are designed to accommodate a minimum wind pressure of 100 miles an hour—a little variance from normal steel tower safety limits, since so great a pressure is not usually encountered at so low an altitude.

It is anticipated that where there are county forestry departments, costs will be divided about as they are in Los Angeles County, Cal., which is considered a standard set-up. Here, the county defrays the cost of the towers, while the C.C.C. absorbes the labor costs. Where there are no C.C.C. units available (which is not probable, since where there are important forests there are in almost all cases C.C.C. camps), the county will take over labor costs as well.

In private forests, about the same rule will prevail, but C.C.C. men will be available for this service even in private forests, since the idea is to get as complete protection of forests as possible, in the shortest possible time.

Prefabrication Required

Therefore, bids may be called for, by States, counties or private owners, but specifications will parallel Federal usage.

The standard specifications are the result of long experience in

Our First Line of Defense Against Floods, Drought and Dust

forest work, and therefore bids on towers differing in design or even in detail can not be considered.

The bidders are required to furnish all structural steel shapes; metal sash glazed with clear double-strength glass; sheet metal rivets and bolts (number required plus 5 per cent), including bolts for fastening down the cab flooring, landings and stair tread; anchor bolts and reinforcement bars for footings; and two base plates for 1-in. pipe with provision for attaching to corner angles of cab to make one or more complete towers as specified. The Government or other owner will furnish or purchase hinges and lock for cab trap door; ventilator base and ventilator; cast iron floor register, and lumber, cement, etc.

All structural shapes and metal (including sheet metal) must be completely fabricated so that it will not be necessary to do any cutting, bending, drilling, punching or reaming in assembling the tower.

Structural steel and rivets must conform to United States Government master specifications F.S.B. No. 351a, "Steel, Structural for Bridges," Class A, "Structural Steel, Non-Copper" and Class C, "Rivet Steel, Non-Copper." Reinforcing bars must conform to United States Government master specifications F.S.B. No. 350a, "Bars Reinforcement, Type B, Grade 1," and anchor bolts must be Type A, Grade 1. The successful bidder will be required to furnish certified analysis showing chemical and physical properties of the run or runs of steel covering the material from which the towers are fabricated.

Sheet metal for roofing and siding must be pure iron or copper-bearing steel, 20 gage.

Metal sash must be equal to Fenestra sash manufactured by the Detroit Steel Products Co.

Incidentally, all punched holes must be so accurately placed that the tower will go together without the necessity of reaming or of drifting or distorting the material.

Successful bidders will be required to submit two sets of shop drawings for approval before fabrication is started. In case shop drawings covering similar towers have been approved the bidder may refer to these and no additional shop drawings will be required.

All Work Must Be Galvanized

After all the shop work has been finished, all structural parts of the tower shall be thoroughly galvanized by using the hot process. And the galvanizing will be subjected to the usual chemical tests.

Each member of a tower must be marked to indicate its position in the tower, and all members that form one tower will be put up in bundles, the bundles to be tagged with the tower number and with the proper erection marks. The bolts will be boxed, allowing an excess of 5 per cent which will be separately boxed.

Any bidder who can meet the technical specifications can, of course, easily handle the dimensional specifications which, naturally, vary with each section of the tower. Any single section is capable of becoming a base for all the equipment above it.

All Forests, Including Private Tracts, to Be Protected

In addition to State and county forests, it is estimated there are at least 381,000,000 acres of private forests on which private owners have failed to install such management as will protect the forest adequately, and since more than 90 per cent of all burned areas in recent years has been on private forests, and since, furthermore, the silting up of our expensive dams and erosion in general can be largely traced to forest destruction, the Government now has come to consider the whole problem of reforestation, protection of forest and erosion as a more or less complete problem, a unit.

(CONTINUED ON PAGE 82)

Type and arrangement of steel sash. The lookout is ranging a fire preparatory to telephoning its bearing from the station.

Expansion of Unit-

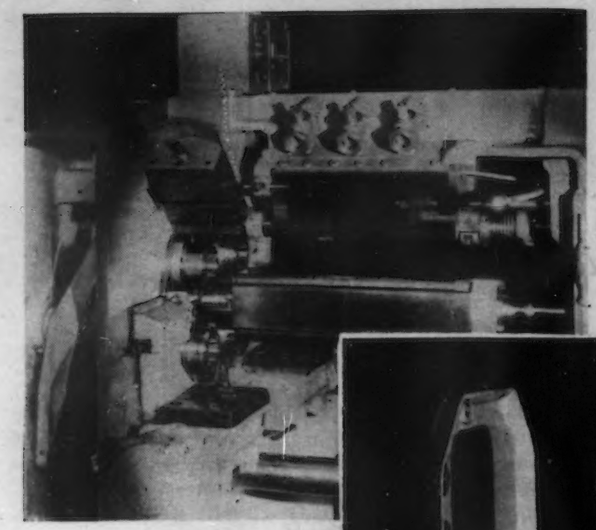


FIG. 1. This characteristic "skeletonized-frame" design, in a multiple spindle screw machine, provides for accessibility of parts and units through rail-mounted covers of types which confine oil and chips within proper spaces. It permits of metal distribution in a manner to meet strength requirements on a basis of the work to be done by each unit.

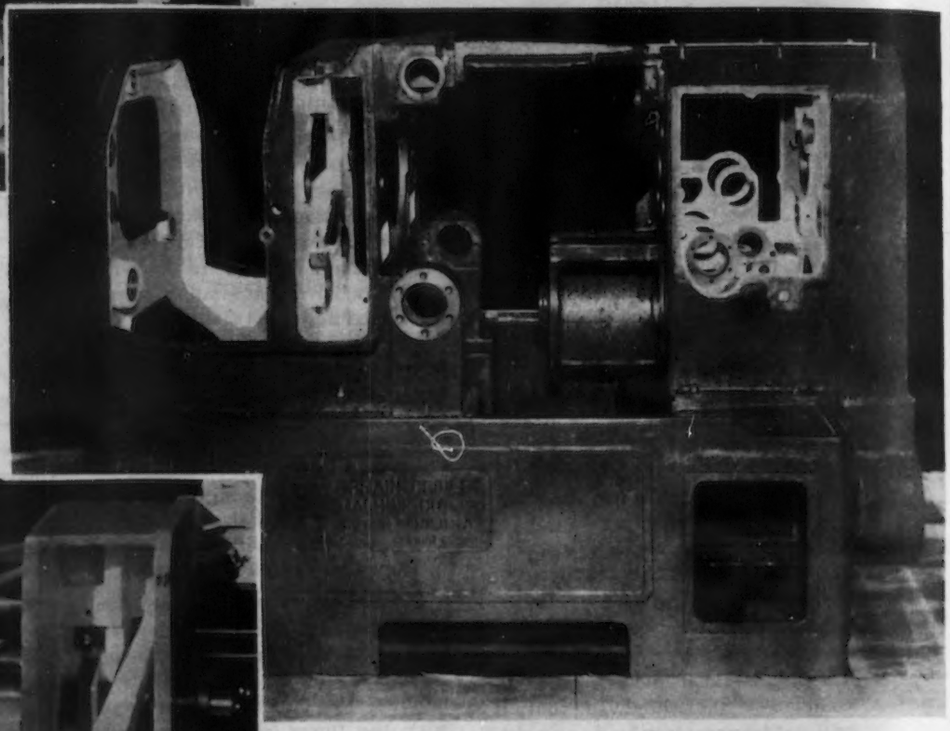


FIG. 1-A. A close-up showing the relation of various provisions covering tool mounting, and adjustable positioning, for the accomplishment of simultaneous tool action uppon chuck-held bars of stock.

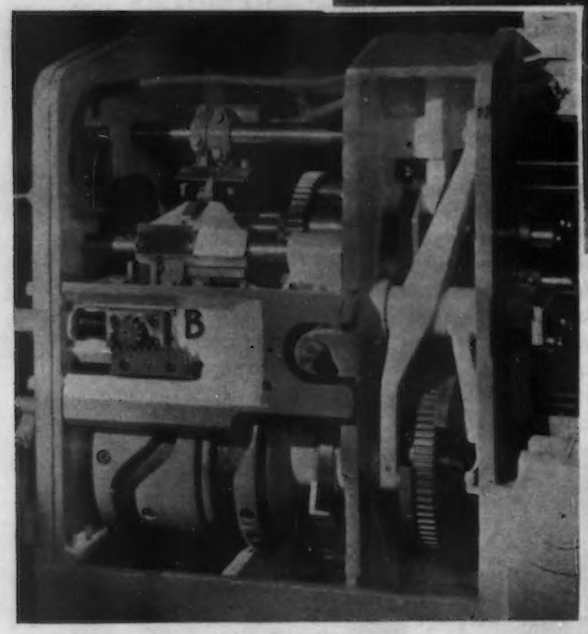


FIG. 2-X. Well designed support provision for various unit-elements and movements is simple because of the open construction involved in a skeletonized frame. Such support provision facilitates both original unit assembly and any maintenance assembly that may be required.

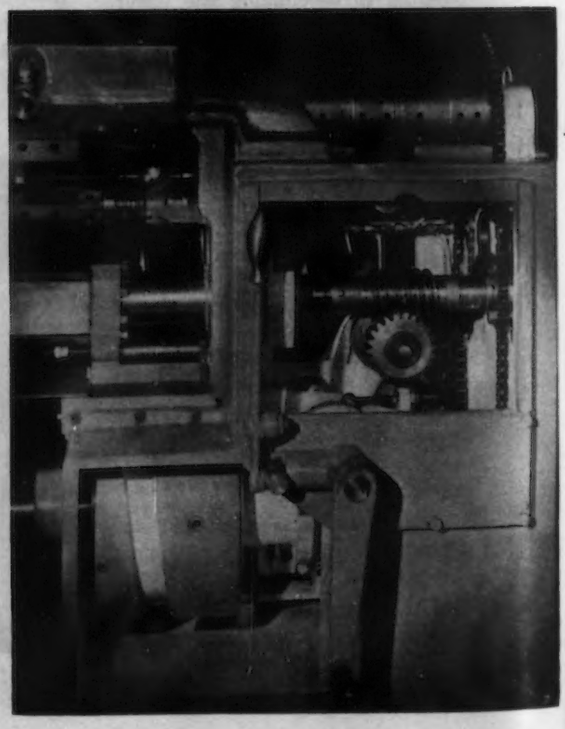


FIG. 1-B. The unit power case is separately assembled, mounted and removed. Provision is included, on its top, for mounting an auxiliary tool slide cam drum. The drum is in convenient position and adjacent to the tools which are operated by its cams. The independent chain drive to the drum is shown.

Features Marks

By L. M. WAITE

Improved Screw Machine Line

IN developing its unit-system of "cleanlined" machine tools, embodying retention of characteristic "skeletonized-frame" construction, the New Britain-Gridley Machine Co., New Britain, Conn., has approximated 92 per cent interchangeability of parts and units between certain of its new models, four and six spindle automatic screw machines.

Bar Capacities

Bar capacities of the four and six spindle models involved, four in number, are, from ⅝ in. up to 2¼ in. round stock.

The six spindle machines feature the same provisions for rigidity, accuracy after assembly, and continuation of that accuracy, as are embodied in the design of the four spindle units, and thus a general description will serve for all.

The Units

The skeletonized-frame assembly is illustrated in Fig. 1. The base and spindle-head frame, at left, is a unit casting in the No. 40 and No. 60 models. The power-case frame, at right, is a separate unit quickly removed or replaced. The overhead tie-member contains an oil compartment for central overhead distribution of cutting tool lubricant. It is also the supporting member for auxiliary tool slides, Fig. 1 A. The slides are operated from a cam drum mounted on the top of the power case as shown in Fig. 1 B. The drum is inclosed, see Fig. 2, but is easily accessible by means of a lifting cover.

The spindle end of the frame, with model 40 parts assembled, is illustrated by Fig. 2 X. Relative positions are shown in Fig. 3.

Cylindrical Cross-Slides

Cast supports for the cylindrically mounted cross-slides are clearly shown in Fig. 1, while Fig. 4 permits study of the relation of the slides to the spindles and to the main tool slide. The slides, in reciprocating travel, have full cylindrical bearing on their one-piece, hardened and ground, stud supports and therefore have full support regardless of the up or down pressure of the side tools. In the two upper positions the studs are of slightly smaller diameter than in the lower positions but the reduction is compensated for by cast supports at each end of the smaller studs.

The vertical, left-hand face of each front and rear slide is guided, in its cross travel, between two hardened, ground and adjustable fitted ways. The lower half of the ways guides the lower cross-slide while the upper half guides the upper slide. The assembly is shown in Fig. 4, at A. This construction provides a straight-line travel against any tendency of the slides to turn on their cylindrical mountings.

The operating cam for each double-arm, two-position cross-slide lever, it will be noted, is not positioned on an underneath drum but is now more accessibly located. The cam and lever movement can be visualized from Fig. 3. The design provides operating convenience and extended chip room. See Fig. 4. Chip accessibility is illustrated by combined reference to Figs. 4 and 6.

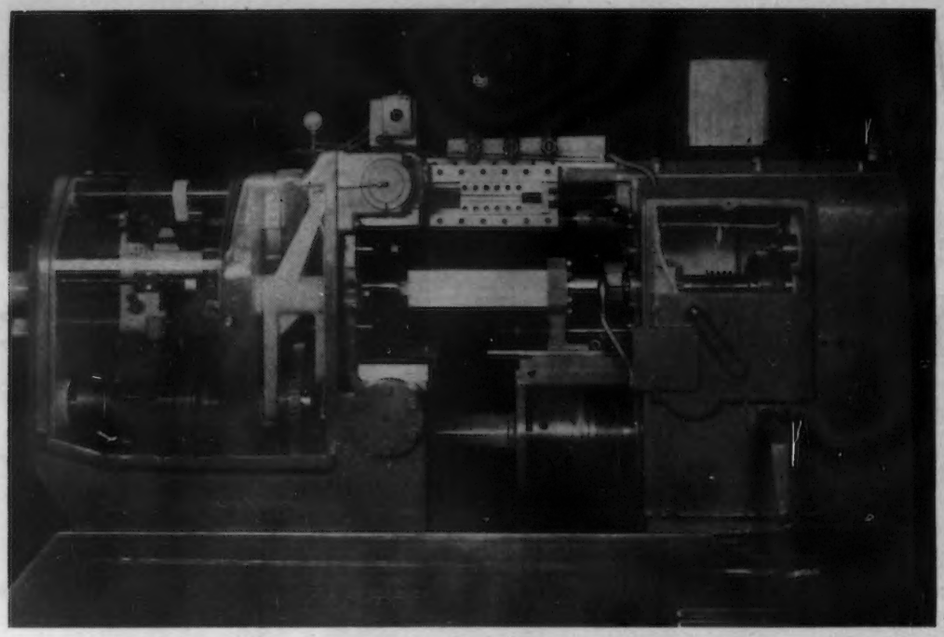
Cross-slide tool-holder bases are hardened and ground and are equipped with micrometer adjustment.

The auxiliary overhead tool slides, one for each top position, Fig. 1 A, and operated from cam drum Fig. 1 B, are used for operations such as threading, accelerated reaming, etc. These operations are independent of the main tool-turret or slide.

Stock Feed

Stock feed adjustment is provided through rack and pinion attached to a supporting cross member, Fig. 2 X. Adjustment is by positioning a longitudinal screw in the rack and pinion mechanism. This provides feed-slide movement to the predetermined length which is indicated on a scale, with pointer, as shown on the slide, above and in from the rack and pinion, Fig. 2 X, at B.

The chuck release, for feeding-out in the front top position after cut-off, is by cam movement in conjunction with a chucking shoe and a new spherical roller-chucking device. This new mechanism is shown in the front top position, Fig. 5. It consists of a spool and yoke. The spool has hardened and ground inner and outer sleeves. These are actuated by cam-operated chucking shoes and give axial movement to the chucking tube. The movement and the chucking pressure are distributed over 10 barrel-shaped rollers, which ride over a circumferential cam surface within the spool and over an opposed taper-turned surface on the actuat-



IG. 3 An illustration which visualizes the tie-up of component parts and units in the finished machine assembly.

ing sleeve. The combined result of the rolling action is the chuck-tube movement necessary to close the chuck "in" on the stock. Chuck-tube adjusting collars are readily accessible. The layout provides maximum pressure with minimum use of power, because of the distribution of the closing force. Centrifugal force, as a factor in chucking, is eliminated. The design includes provision for hand chucking while setting-up.

Gage Stop

The stock-feed gage-stop operates in the upper front position, where it is free from any accumulation of chips or litter. It is of swinging type, to permit of convenient removal of butt-ends, yet is so arranged that it cannot be left out of position. Unless the stock-feed tube is in proper position, it might be interfered with by a loose butt-end, its shoe is latched in its wrong position. Through a switch connection with the motor, the machine is thrown out in this eventuality, and cannot be started until correct positions are restored. This protection is a part of the automatic electric stop system which includes a tell-tale light.

Any starting of the machine requires that the starter button be depressed until the pressure dial records a 15-lb. pressure, or any other predetermined pressure, on the lubricating system.

Box-like base construction and the convenience of chip removal and coolant loading are illustrated in Fig. 6. Chip removal may be either by conventional method, or by selectively speeded conveyor. The practicability of conveyor removal is evident by reference to Figs. 6 and 4.

Indexing

The IRON AGE, April 11, 1935, described the company's method of indexing its six spindle automatic chucking machine. The description included free-rotating, non-wearing, index design, whereby the circumference of the cylinder has no wearing contact while indexing. In the improved screw machines here illustrated, the design has been further carried out

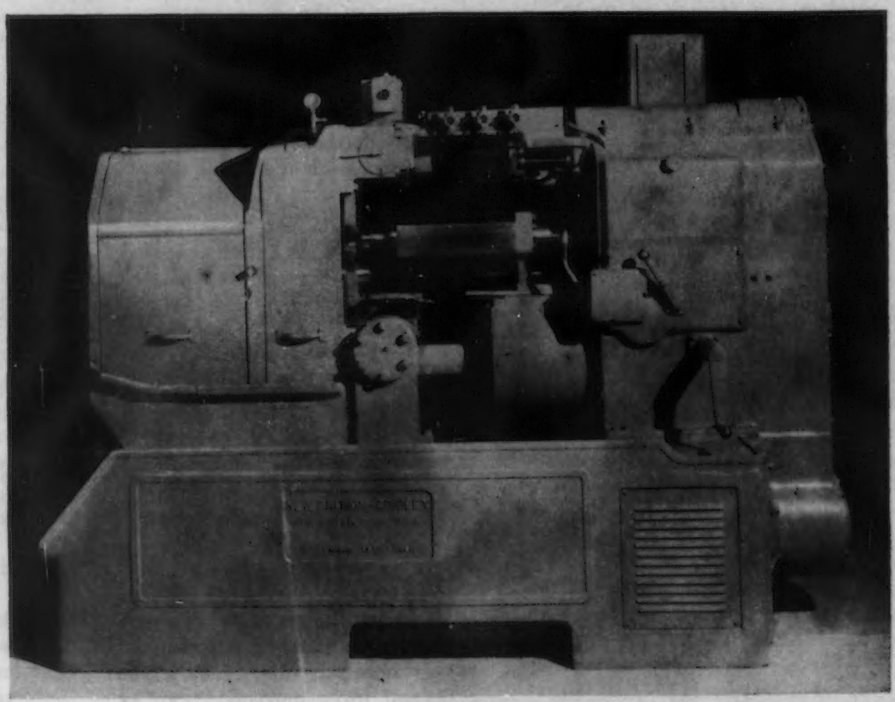


FIG. 2. The finished machine is a "Cleanlined" product, well guarded against the "messy" conditions which were at one time common to the operation of screw machine departments. It is representative of engineering effort in meeting the design-conscious trend which will ultimately bring about increased confidence in industry through bettered shop-appearance.

FIG. 4. This cut-away view has a direct relation to the end view, Fig. 6, in connection with the screw machine chip problem. The open-space provision for falling chips is noteworthy.

FIG. 6. This end-view is illustrative of box-type base construction and, in connection with Fig. 4, permits visualization of chip-riddance as provided for. Convenience in oil loading is also clearly in evidence.

in this respect, through the incorporation of a positive, cam-operated, cylinder lifting mechanism as an assurance against clearance failure. In connection with this mechanism, a conveniently located, line-indicated dial records the position of the cylinder, as to clearance, at all positions of the adjustable bronze lifting-shoe. The indexing is by a type of Geneva movement. The application involves care, precision and ingenuity in design, material selection and finish of all parts entering into the operation and locking of the cylinder.

Main Tool Slide

The rigidity of the main tool-slide support and of its cam-drum mounting, for feed of end tools positioned on the main tool slide, is brought out in Figs. 1-1A-3. The drive of and provision for cam operating the auxiliary tool slide is shown in Fig. 1 B, while Fig. 3 shows the finished-assembly relation of auxiliary-slide tools to main-slide tools.

A short spindle design is employed for the greatest possible reduction of deflection. This can be seen in Fig. 5. Spindles are mounted in large diameter, preloaded, radax-type bearings. Ranges of speed are provided to cover the requirements of modern tooling and materials.

Cams

Cam design employed covers individual and unit cam-removal, transposition and interchangeability. Universal cams are featured for use in a wide variety of short runs. Using model 41 as illustrative of feed changes, there is a selective range for tool slide from 0.0009 in. per revolution, to 0.347 in. per revolution, through pick-off gears. Cross-slide feed range is from 0.0C015 in. to 0.0493 in.

Attachments

The threading attachment is universal in type, permitting the use of self-opening dies or solid taps. The attachment is transposable to either of the two top positions. Tapping may be done in either or both of the two top positions. Self-opening dies may be used in any one or in any three positions.

Drill speeders are mounted in preloaded ball bearings and are

(CONTINUED ON PAGE 82)

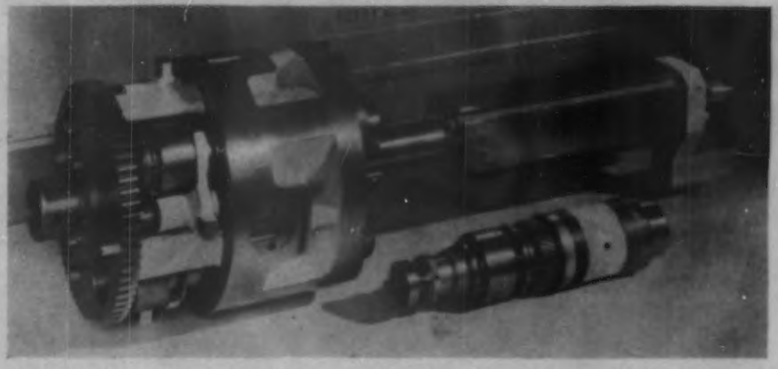


FIG. 5. Details of a spindle carrier, spindles and chucking mechanism, and of relationships to main tool slide, are illustrated in this view of a four spindle screw machine unit-assembly.

Improvements in Production

New Horizontal Machine for Precision Boring, Drilling and Milling

HIGH-POWER, precision horizontal boring, drilling and milling machines with head stocks of the quill type in various multiple head combinations are being offered by Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., and are adaptable to a wide variety of work.

A bore spindle, sliding in a sleeve driven by a bull gear, is employed. In place of mounting the spindle in the headstock proper it is mounted in anti-friction bearings within the adjustable quill and the drive modified to suit the in and out movement of the quill.

For heavy duty milling, the quill is moved out until the milling cutter is properly set. After roughing, a finish cut can readily be taken by adjusting the quill. To facilitate precision settings for depth, a hardened steel block is attached to the front cover plate of the quill. Both hand and power adjustment of the quill is by means of the regular spindle feed mechanism.

To prevent damage in overrunning, the quill rack terminates in ratchet teeth, one at each end. These automatically cut out the feed but permit the quill to be picked up again by merely operating a turnstile in the opposite direction.

Directional control levers are employed for headstocks and table movements.

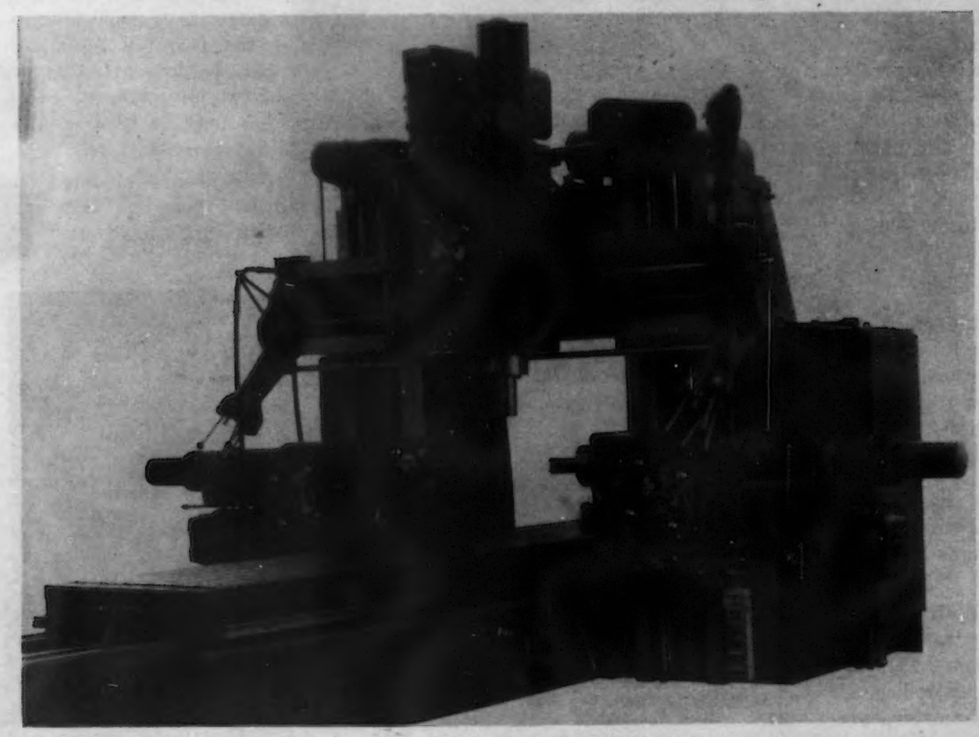
Table and headstocks may be started, stopped and reversed singly or together; they are entirely independent both in regard to time and direction. This permits that an operator may follow a given irregular outline by using power feeds to the table and horizontal headstocks for vertical surfaces, or to the table and vertical headstocks for horizontal surfaces.

Individual of the headstocks, as well as the table, have feed boxes with 18 independent steps which, in connection with their independent operation, make it possible to face mill surfaces such as flanges, pads, etc., that run at an angle with the top of the table.

All in all, 324 combinations can be directly engaged, giving a large number of practical combinations.

Rotation of a turnstile handtraverses either the spindle or the quill. A pull on any one or several of the turnstile handles engages the power feeds; a push or tap disengages them. With the feed reverse lever in neutral, micrometer hand feed adjustment either to the spindle or the quill becomes operative through the hand wheel positioned at the quill.

By cranking the lever of the spindle-speed selector or that of the feed selector either forward or backward, nine changes of speeds respectively are obtained. A single back gear for the feeds doubles the number, giving 18 independent feeds, while two sets of back gears in conjunction with the speed selector provide 36 separate spindle speeds.



Safety trips limit the movement of the various units in all directions. The entire design provides power reverse movements by directional control. All verniers can be set to the nearest full inch, eliminating much decimal figuring. Graduations read in 0.001 in.

Each headstock is driven by a separate motor; the table drive is a separate motor driven unit; the rail

and Shop Equipment . . .

is raised and lowered by a separate motor, and the oil and coolant pumps are individually motor driven. A portable push button panel is located on each side of the machine.

The various motors are electrically interlocked and all feeds are protected by an emergency stop button. Overloaded oil pump, table feed or headstock motors automatically shut down the entire machine.

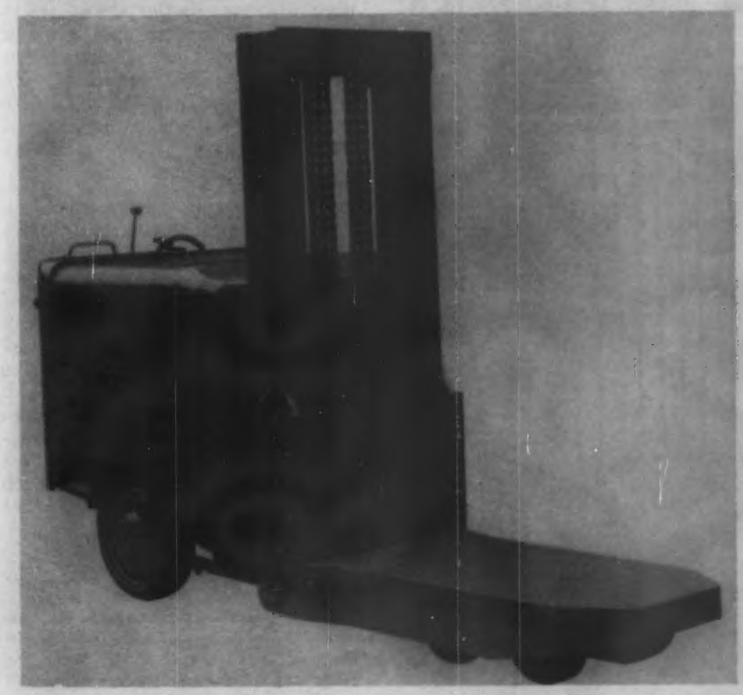
Mechanical controls are provided. Lubrication is automatic at all important points.

Material specifications are: beds, columns, tables, saddles, close grain alloyed cast iron; spindle and spindle bushings — nitrided; spindle sleeve—heat treated nickel alloy forging; quill—heat treated nickel alloy forging; gears—alloy steel drop forgings, hardened; short spline shafts—alloy steel, heat treated; screws and long spline shafts—turned and ground high carbon steel bars.

The machines are built in 3½-in. and 4½-in. spindle sizes. Standard working table is 4 ft. x 12 ft., and has a cross feed of 10 ft.

Lift Truck Has Modernized Specifications

FIVE-TON capacity is specified for a new "Hylift" industrial truck announced by Baker-Raulang Co., Cleveland. The truck is pictured below. Clean-lined design features the outward appearance. A large part of the operating and control mechanism has been placed within the battery compartment inclosure. Redesign of this mechanism has resulted in a stronger and smoother operating truck. Hoisting is accomplished by two double alloy-steel roller chains, each having a capacity of 46,000 lb., giving a factor of safety of 9.2 at this point. The hoist unit is quadruple-reduction spur gear type with all gears of heat-treated alloy steel and mounted on either ball or roller bearing shafts. Platform movement is protected at both the upper and lower limits of travel by cut-out control switches and by the use of an overrunning clutch in the hoist unit.



The uprights are 10-in. cast alloy steel channels with 1¼-in. thick web and flanges. The platform has 1¼-in. high-carbon steel lift-arms and carriage, electrically welded to a diamond-pattern platform plate. Platform rollers are of heat-treated and ground alloy steel, 7½ in. in diameter, mounted on ball bearings.

The main frame is ½-in. flame-cut high-carbon steel plate with cross members extending from the operator's end of the truck to the uprights. The underframe is built up of two 1¼ x 5-in. and two ¾ x 5-in. high-carbon steel plates. The dual trailing axle is alloy steel and is fully compensating, permitting passage over road obstructions without danger of tipping. Each trailing wheel is mounted on two adjustable tapered roller bearings, carried on individual knuckles, which turn on ball thrust and roller radial bearings.

The steering gear is of worm and wheel type actuated by a vertical hand wheel. Main steering rods are of heat-treated alloy steel and all clevis connections are fitted with needle bearings.

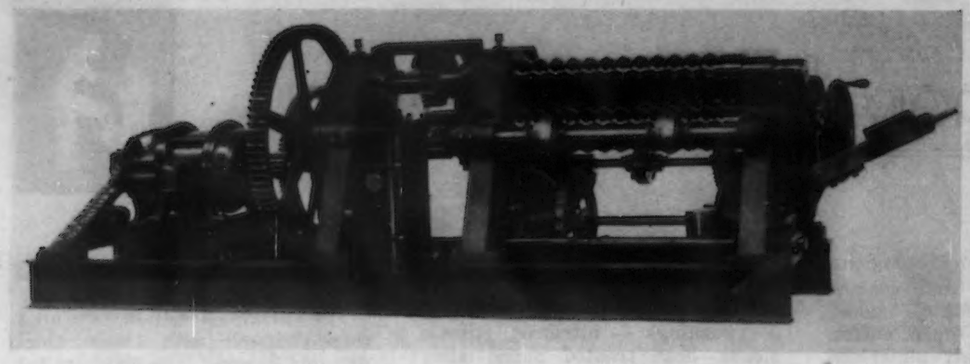
Power axle is the company standard design employing worm drive. Duplex compensating suspension holds the axle in alinement while allowing it to move freely in a vertical direction over rough floors.

Both the travel and hoist motors are company built and have an overload capacity of 300 per cent of the rated load for 30 min.

Vulcanizing Method For Transmission Belt

GOODYEAR TIRE & RUBBER CO., Akron, Ohio, announces a new vulcanizing method for splicing the company's compass cord transmission belting. By this method endless belts can be installed without dismantling pulleys. The method is one of dovetailing the load-carrying core of cords at the splice.

The spliced portion is vulcanized with a portable vulcanizer developed for the purpose.



Machines for Forming Corrugated Metal Units

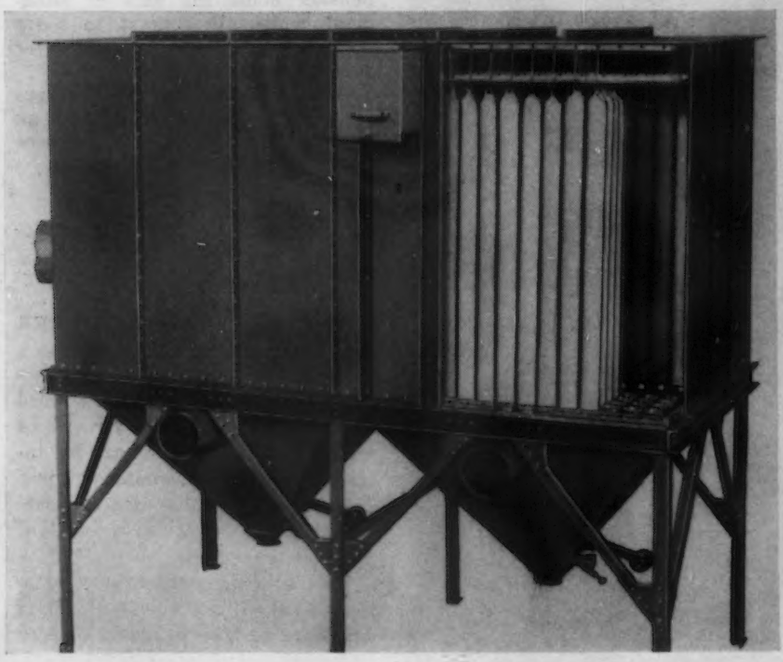
PATENTED curving or bending rolls, in an improved 10-hp. motor-driven machine assembly, are marketed by Geo. Whiting Co., Inc., 1719 Elston Ave., Chicago. The equipment is shown at top of page. It may be belt driven if desired. A hinged housing, so balanced that little effort is required in the handling of heavy work, is a feature. The top roll is balanced by means of a lever in front of the hinged housing and can be thrown out of position for work removal. In this unloading operation the roll remains in longitudinal position and is not tilted "up." The machine is of the Initial type, with the top roll over the bottom roll, which is adjustable diagonally.

The machine set-up is not disturbed in operating the hinged end housing. A sliding latch serves in holding the top roll out of position and in lowering the end housing and automatically locking it. It is not necessary that the machine be stopped for either loading or unloading.

The balanced feature can be used on the pyramid type of bending rolls in forming plain steel pipe, tanks or cylinders of large area. Maximum operating floor space required is 6 ft. 1 in. x 12 ft. 10 in., with the swing housing and lever in down position. The approximate weight of the equipment is 5750 lb.

Bag-Type Air Filter Of Improved Design

IMPROVED and redesigned tubular bag-type dust filters are now offered by Ruemelin Mfg. Co., 3860 North Palmer Street, Milwaukee. Filters are made in standard unit sizes of 1830, 1375 and 915 sq. ft. cloth area. Ratings are based on 3 cu. ft. of air per min. per sq. ft. of cloth.



Suction of the exhaust fan delivers the dusty air into the dust hopper and, because of reduced velocity, all heavy particles are deposited in the hopper. The very fine or "smoky dust" passes upward to the inside of the cloth bags. Air passage through the closely woven heavy cloth filters the dust content, which is precipitated on the inside surface of the cloth bags, thereby avoiding wear on the fan. In order to eliminate back pressure or resistance to the ventilating air current caused by precipitated dust, all bags are mechanically shaken periodically. All precipitated or reclaimed dust falls into a fully inclosed dust hopper.

The special filter cloth is formed into a "tube" having a closed top and open bottom. All seams are doubly folded and sewed for strength and to protect against dust leakage. The top of the bag is provided with a hanger rod for suspension from the ceiling of the filter housing. The bottom of the bags are telescoped over shouldered collars and provided with felt seal. Special wire clamps insure against loosening of the bags and dust leakage. A steel ring sewed near the top of the bag maintains its circular shape, which permits of thorough dust removal when the bags are shaken. The bags are installed vertically with sufficient clearance to eliminate contact of adjacent bags, thus avoiding cloth wear, and to assure unrestricted air flow.

The filter tubes are inclosed in a heavy-gage steel housing, rigidly re-enforced to withstand high vacuum. Rib construction insures air tightness and a weather-proof condition. The dust hoppers are constructed of heavy gage steel plates which are angled for the discharge of all precipitated dust. A settling or pre-separation chamber can be furnished for any capacity filter, through which dust of an abrasive nature passes. Such a chamber lengthens the life of the cloth tubes.

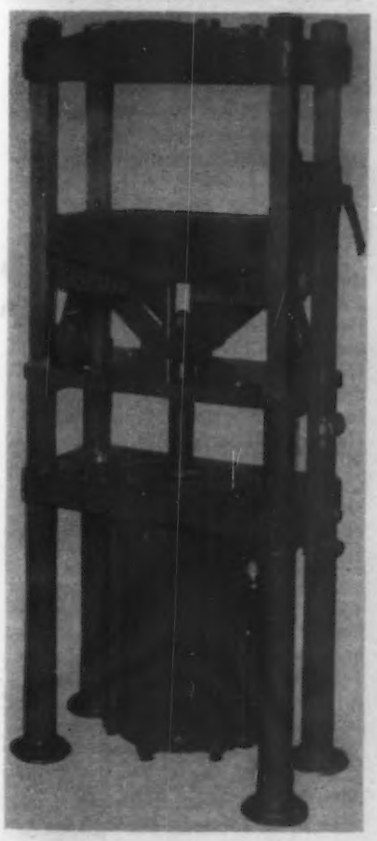
Osborn Machine Co., DuBois, Pa., has opened Pittsburgh sales office, 820 Empire Building, in charge of C. K. Wehn, recently appointed general sales manager.

Air-Operated Platen Press for Rapid Molding

A COMPACT 15 to 18 ton capacity air-operated platen press for plastics and rubber molding operations is announced by Hannifin Mfg. Co., 621-31 South Kolmar Avenue, Chicago. The design provides an advance stroke of six times the speed of the pressing stroke. The advance stroke is 5½ in. at 6000 lb. pressure and the pressing stroke 1½ in. at 30,000 lb. This cycle of operation permits rapid production, and one operator easily handles several presses. Utility covers both hot and cold molding, and rubber molding operations. Speeds and pressures may be regulated to suit individual requirements of any particular work.

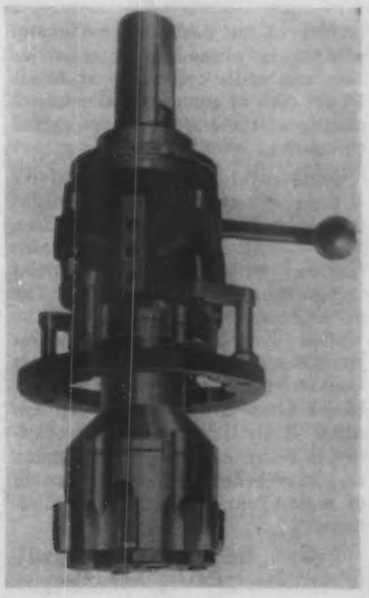
A feature is the provision for the use of maximum cushioned pressure to "break" or separate molds on the reverse stroke after the pressing operation is completed. An air cushion at the end of the stroke prevents shock. Use of the ordinary shop air supply makes it unnecessary to install hydraulic pumps or special hydraulic power supply.

Specifications are: Platen 17 x 14 in., between columns 22 in., platen down 17½ in., and platen up 10½ in. The capacity of 15 tons is with air line pressure of 80 lb. per sq. in.; 18 tons at 100 lb. per sq. in. The same type press inverted is available for bench mounting.



Extension Link for Collapsible Taps

FOR tapping threads that are longer than provided for with standard taps, the Landis Machine Co., Waynesboro, Pa., has designed a special link for use between the body and head of certain of its collapsible and receding chaser

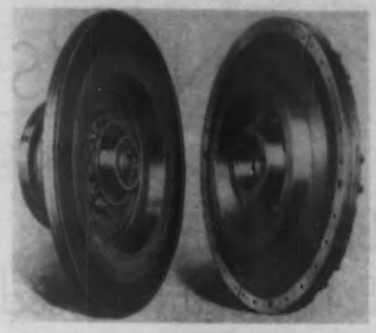


collapsible taps. The application of the device is possible because of the fact heads and bodies are separate for the original purpose of using heads of different sizes with a single body. The illustration is of a 6½-in. vertical reach.

The extension link is machined on one end and drilled and tapped to fit the tap body while the opposite end is prepared to fit the tap head. This standardization obviates the necessity for special parts. The length of thread desired is the determining factor in link-length. Application can also be made on a tap required for reaching the bottom of a deep hole, even though a short length of thread is required. The link can be removed at any time and the head attached directly to the body, making a standard tap assembly.

Magnetic Clutch With Improved Adjustment

SEVERAL important improvements in a general purpose magnetic clutch are announced by Cutler-Hammer Inc., 258 North Twelfth Street, Milwaukee.



The method of adjusting the friction faces to compensate for wear and to assure uniform lining engagement is featured. The inner circumference of the field ring is threaded and adjustment is made by rotating the field ring, in respect to the magnet field member, and consequently moving it toward the friction surface on the armature member. When the field ring has been moved forward sufficiently to compensate for the wear, it is locked firmly in position.

A floating magnet armature is said to make it impossible to score the magnet pole faces even if proper adjustment on the lining is not maintained.

Other features of the new design include a magnet coil which may be readily removed and replaced as a unit, rugged bronze collector rings, a lining wear indicator, and a pilot bearing to insure concentric engagement of the two members.

Associated Machine Tool Dealers to Meet

ASSOCIATED Machine Tool Dealers annual meeting will be held at the Cleveland Hotel, Cleveland, Sept. 9. It is to be noted that the date just precedes the opening of the machine tool exposition, to be held in the Public Auditorium, Cleveland, Sept. 11-21.

CHADWICK MACHINERY CO., Milwaukee, has been appointed distributer of Link-Belt crawler shovels, cranes, draglines, and locomotive track-type cranes.

NEWS OF THE WEEK

British Iron Melters Booked For Months Ahead

LONDON, ENGLAND, July 30 (*By Cable*).—Consumers are buying foundry iron heavily in anticipation of higher prices and furnaces are being temporarily switched as a result from basic to Cleveland iron. The supplies in all grades of foundry iron are insufficient and makers are heavily booked for months to come.

Steelmakers are busy but there is a dwindling of orders in anticipation of the coming holiday shutdowns. Limited sales of Continental semi-finished varieties are being resumed but English consumers are well covered by domestic producers. Finished steel deliveries are still expanding, construction engineers are busy and plate mills are profiting from recent shipbuilding orders. Exports are quiet.

There is a moderate amount of buying of tin plates at home and also from abroad with inquiries fair and mills operating at about 50 per cent of capacity. Works are closing at the end of this week for the annual week's holiday.

Continental iron and steel activity is unsatisfactory but with a slight improvement. There have been some fair Russian orders in connection with Belgium's official recognition of the U.S.S.R. The provisional agreement with the United Kingdom has been prolonged until Dec. 8, but with a United Kingdom import quota based upon 670,000 tons per annum. A British import control office is being established in London and it is believed that the signing of a five-year agreement is imminent.

Poland has joined the Continental Steel Cartel and also recently became a full-fledged member of the International Wire Export Co. International Rail Makers' Association is reported to be prolonged for five years and to have reached an understanding with Poland.

British Prices, f.o.b. United Kingdom Ports

Per Gross Ton

Ferromanganese, export	£9
Billets, open-hearth	£5 10s. to £5 15s.
Tin plate, per base box	*18s. 2d. to 18s. 7½d.*
Steel bars, open-hearth	£7 17½s.
Beams, open-hearth	£7 7½s.
Channels, open-hearth	£7 12½s.
Angles, open-hearth	£7 7½s.
Black sheets, No. 24 gage	£9 5s.
Galvanized sheets, No. 24 gage	£11 5s.

*To Nov. 1; 18s. 5d. to 18s. 10½d. thereafter.

Official Continental Prices, f.o.b. Continental Ports

Per Metric Ton, Gold £

Current dollar equivalent is ascertained by multiplying gold pound price by 124.14 to obtain franc equivalent and then converting at present rate of dollar-franc exchange.

Billets, Thomas	£2 7s.
Wire rods, No. 5 B.W.G.	£4 10s.
Steel bars, merchant	£3 5s.
Sheet bars	£2 8s.
Plate, ¼ in. and up	£4 2s. 6d.
Plate, 3/16 in. and 5 mm.	£4 4s. 8d.
Sheets, ⅛ in.	£4 9s. 8d.
Beams, Thomas	£3 2s. 6d.
Angles (Basic)	£3 2s. 6d.
Hoops and strip base	£4 2s. 6d.
Wire, plain, No. 8	£5 7s. 6d.
Wire nails	£5 15s.
Wire, barbed, 4 pt. No. 10 B.W.G.	£8 15s.

G. E. Organizes "Houses, Incorporated"

FOR the purpose of cooperating in the encouragement of house building of all worthy types, the General Electric Co. has organized a separate company, known as Houses, Incorporated. It will be the purpose of Houses, Incorporated, to cooperate with others in the development of houses of any type which seems worthy and promising; to conduct research work; and to assist in the management and financing of such enterprises.

Charles E. Wilson, vice-president of the General Electric Co., will be chairman of the board of the new enterprise; Foster Gunnison, who has been associated with Houses, Incorporated, since its inception, will be president; James L. Hagar and J. A. Olson, vice-presidents. The directors, in addition to Messrs. Wilson, Gunnison and Hagar, will include P. D. Reed, J. W. Lewis and vice-presidents T. K. Quinn of the General Electric Co. Offices will be located in the General Electric Building, 570 Lexington Avenue, New York.

Since it is primarily concerned with the interior mechanism of the house, the General Electric Co. has not been, nor will Houses, Incorporated, be, the proponent of any particular type of construction enclosure, it was announced, whether it be prefabricated, partly prefabricated, or the traditional enclosure.

General Electric, through its ex-

ecutives, has declared its interest in better living conditions and modern housing for three reasons: first, because the modern house absorbs an increasingly large amount of electrical materials and appliances; second, because as a consumer of electricity the modern home puts additional demands on the power supply company, which ultimately reflects itself in an increased market for power plant and transmission and distribution equipment; and third, because as a contributor to social improvement and general economic recovery, a large program of home building promises the greatest service to the nation. To develop a large market for modern homes, the company believes it essential to improve their quality and livableness, to reduce their cost, and to develop methods of extended but safe financing.

Council to Accredit Engineering Schools

THE Engineers' Council for Professional Development, sponsored by leading national engineering societies, engineering educators, and engineering examiners has inaugurated a program for accrediting engineering schools in New England and the Middle Atlantic States. The program will be offered to the other parts of the country after a trial period in these two regions. Notice is being sent to the presidents of all degree-granting engineering schools in the two areas advising them that the Engineers' Council stands ready to receive requests for consideration of particular engineering curricula which the schools may wish to submit.

A. O. Smith to Supply "High-Yield" Casing

A. O. SMITH CORPN., of Milwaukee, has announced that it is now ready to supply the new "high-yield" casing, of which considerable has been heard in the trade recently. Production has begun on 6⅝-in. and larger sizes. The casing will be made to A.P.I. standard dimensions.

The process by which "high-yield" casing is made is patented and said to be an entirely new departure in this form of metal working. The compression yield strength has been raised to closely approach the ultimate tensile strength of the steel.

Toledo Steel Buyers May File Complaint with Trade Commission

THE transportation department of the Toledo Chamber of Commerce has filed a brief with the American Iron and Steel Institute, charging preferential price treatment of consumers in the Detroit area and alleging discrimination against buyers in the Toledo industrial district. The brief was signed by 39 iron and steel users in the Toledo area and it is stated that Toledo's steel requirements, at the present rate of consumption, aggregate 300,000 tons annually.

The brief calls attention to a code resolution which established a freight arbitrary of 20c. per 100 lb. on certain products for delivery to Detroit. The actual freight rate from Pittsburgh to Detroit is 26½c. as against 23½c. to Toledo. Toledo is robbed not only of its former advantage of 3c. over Detroit but is also put to a disadvantage by the waiving of 6½c. of the freight rate from Pittsburgh to Detroit.

The Toledo brief ask that the same concessions be extended to iron and steel consumers of Toledo as are now being made to industries in the Detroit switching district, pointing out that even this represents a sacrifice on the part of Toledo. It is reliably reported that if the steel industry does not accede to the request of Toledo consumers, a complaint will be filed with the Federal Trade Commission.

Republic to Modernize Canton Sheet Mills

REPUBLIC STEEL CORPN. will entirely modernize the sheet mills of its Stark Division of the Central Alloy district, Canton plant. Improvements will involve an expenditure of $850,000 for new equipment and additional plant capacity.

The new equipment will consist of two automatic, three-high roughing mills, four two-high finishing mills with necessary additional cranes, six pair and pack furnaces, additional pickling machines, a pack shear and cold-rolling equipment. The extension will not increase the plant capacity but will be made for the purpose of improving the quality of the product. The work has been started and is expected to be completed by Nov. 1. Contract for roughing mills has been placed with the Mackintosh-Hemphill Co., Pittsburgh. Most of the other equipment will be supplied by the Wean Engineering Co., Warren, Ohio, and will be manufactured by the McKay Machine Co., Youngstown.

Granite City Steel to Increase Capitalization

THE stockholders of Granite City Steel Co., Granite City, Ill., have voted to increase the company's authorized capital stock from 262,945 shares to 400,000 shares. The money is to be raised by the sale of an additional 137,055 shares to be used for general improvement and modernization plan. At $28 a share, the closing price Monday on the New York Stock Exchange, the amount available would be $3,847,540.

The company's net profits for the first half of 1935 amounted to $312,373, against $200,000 for the first half of last year.

Aetna-Standard Gets Jones & Laughlin License

THE Aetna-Standard Engineering Co., Youngstown, Ohio, recently acquired from the Jones & Laughlin Steel Corpn. an exclusive license to manufacture and sell a new process and equipment for classifying sheet and tin plate made from continuous strip.

The strip is uncoiled, flattened, trimmed, accurately gaged, cut-to-length and automatically sorted into piles of light, medium and heavy gages, at the rate of approximately 250 ft. per min.

Sheets can be classified within very narrow limits, but it has been found that the tolerance from standard gage of plus or minus 0.0005 in. constitutes good practice and will come within the rigid specifications of the consumer.

A novel feature of the process is the stagger piler. This device will accurately count and record the number of good sheets produced, in addition to stagger piling packs containing a predetermined number of sheets.

Model Sheet-Clad Homestead Exhibited at Birmingham

AS an illustration of the advantages of sheet steel in homestead construction, the Tennessee Coal, Iron & Railroad Co., Birmingham, has completed a model steel-clad homestead project for public inspection. The formal opening took place on June 22.

The project occupies a tract of four acres on the south slope of Red Mountain on the outskirts of the city. It consists of a modern steel-clad, four-room cottage, two-car garage, barn, poultry house and corn crib, and is adapted for either rural or urban use. All buildings are constructed of Tennessee sheet steel, applied over wooden framing.

Of particular interest is the cottage. The siding is of painted weatherboard sheets, applied over a wood frame; the roof of V-crimped steel sheets; the ceiling and interior walls of beaded steel sheets. Proper insulation against summer's heat and winter's cold has been amply provided. Wallboard insulation has been placed between the studs and both the outside and inside sheets. Four inches of mineral wool insulation is used between the joists and ceiling sheets.

Various types of fencing, manufactured at Fairfield, have been installed and the grounds surrounding the homestead have been supplied with the special basic slag fertilizer marketed by the company.

Institute of Metals' 27th Annual Meeting

THIS year's Annual Autumn Meeting of the Institute of Metals will be held in Newcastle-upon-Tyne. The 27th gathering of the series, it will take place from Sept. 9-12 under the chairmanship of Dr. Harold Moore, C.B.E., president of the institute.

In accordance with the program just issued, the proceedings will begin in the evening of Sept. 9 with the delivery by Dr. H. W. Brownsdon of the 14 autumn lecture on "Metal Melting—Its Effect on Quality." The lecture will be discussed—a novelty on such an occasion.

On Sept. 10 the assembled members will be given a civic welcome by the Lord Mayor of Newcastle-upon-Tyne before beginning the discussion of a series of scientific papers relating to various phases of metallurgical work. In the afternoon parties will be formed to visit works of metallurgical and engineering interest, and in the evening a civic reception and dance will be given.

On Sept. 11 the morning will be devoted to the discussion of further papers, the afternoon to works visits and the evening to a dinner at the Royal Station Hotel. An all-day motor trip on Sept. 12 to the Roman Wall and Fort at Borcovicus will conclude the conference.

Persons wishing to take part in the proceedings should communicate with the secretary of the Institute of Metals, 36 Victoria Street, London, S.W. 1.

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STEEL is a particularly appropriate material for use in steel company homestead projects. The cottage illustrated is one of a number comprising a new housing development by the Tennessee Coal, Iron and Railroad Co., Birmingham.

PERSONALS

ALEXANDER L. FEILD, consulting engineer for the Rustless Iron Corpn. and president of the Alloy Research Corpn., has been appointed professor of metallurgy at the Carnegie Institute of Technology, Pittsburgh. He will assume his new duties in September.

Professor Feild has successfully developed several processes for the melting and refining of steels, particularly alloy steels, which are of great importance in the steel industry. He received his early training at the University of North Carolina and North Carolina State. Later he served as junior physical chemist and subsequently as assistant metallurgist at the Pittsburgh Bureau of Mines. He left Pittsburgh in 1918 to become research metallurgist with the Union Carbide & Carbon Corpn., remaining with that firm until 1925, when he went to Canton, Ohio, as research engineer for the Central Alloy Steel Co. After two years at Canton he returned to the Union Carbide & Carbon Corpn. From 1929 until 1931 Mr. Feild was research engineer with the Simonds Saw & Steel Co., and from 1931 until the present he has held a consulting position with the Rustless Iron Corpn. in New York and has been president of the Alloy Research Corpn. of Baltimore and New York.

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R. B. NUCKOLS has been appointed assistant sales manager of the Standard Tool Co., Cleveland. Since 1919 he has been identified with the company in the Southwestern territory with headquarters at St. Louis. W. P. Ross is general sales manager.

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CHARLES M. HASKINS, managing director of the National Association of Waste Material Dealers, Inc., New York, and for many years executive secretary of its salvage and reclamation division, will address the American Transit Association at its annual convention to be held in Atlantic City on Sept. 25. The subject which Mr. Haskins will discuss is salvage operations as they apply to electric car and bus transportation equipment.

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G. T. CHRISTOPHER has been appointed vice-president in charge of manufacturing of the Packard Motor Car Co. He succeeds E. F. ROBERTS, who recently retired after 32 years of service with the company. Mr. Christopher had been assistant vice-president in charge

A. L. FEILD

of manufacturing for Packard during the past year and in his new position he will be in direct charge of all manufacturing. For several years before going to the Packard company, Mr. Christopher had been in charge of manufacturing for Oldsmobile, Pontiac and Buick.

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ARTHUR D. HEFFRON, JR., formerly located at the headquarters of the Globe Steel Tubes Co., in Milwaukee, has been appointed to the position of manager of sales of the Cleveland district, with offices in the Terminal Tower Building.

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J. W. COREY, sales manager, and S. B. TAYLOR, works manager, respectively, of the Reliance Electric & Engineering Co., Cleveland, have been elected to the board of directors of that company.

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EDWARD J. BURNELL, general sales manager of Link-Belt Co., central division, with headquarters in Chicago, recently sailed for Europe, where he will investigate coal handling, washing and separation methods employed in England, Germany and Belgium.

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K. T. KELLER, vice-president and general manager in charge of production of the Chrysler Corpn., has been made president, succeeding WALTER P. CHRYSLER, who will continue as chairman of the board and chief executive. B. E. HUTCHINSON, heretofore vice-president and treasurer in charge of financial affairs, has been appointed chairman of the finance committee of the corporation. FRED M. ZEDER, heretofore vice-president in charge of engineering, has been made vice-chairman of the board, and H. A. DAVIES, formerly assistant treasurer in direct charge of the corporation's treasury operations, has been appointed treasurer.

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H. S. NORTON, property agent for the Gary Land Co., a subsidiary of the United States Steel Corpn., has been made a member of the reorganized Indiana State Police Board.

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W. S. CARSON and R. C. GARVEY have been appointed district sales manager and assistant district sales manager respectively of the Detroit Seamless Tube Co., Detroit, with offices at 2110 Terminal Tower, Cleveland. Both men are widely known in the seamless tube industry, having been associated in the sale of tubular products with a number of steel companies.

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Mitchell Specialty Co., Philadelphia, announces the election of ERNEST K. WILLIAMS as president and director succeeding J. J. SEITZ, recently deceased. Mr. Williams came to Mitchell Specialty Co. about four and one-half years ago in the capacity of sales engineer. Two years ago he was made assistant to the president and has been acting president during the past six months.

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A. B. BOK, formerly special service and development engineer of the Cincinnati Milling Machine Co., has joined the Kent-Owens Machine Co. Mr. Bok's technical education was acquired at Ohio Mechanics Institute and the University of Cincinnati. He has in the last eight years been in responsible charge of many very interesting machine design developments, a great number of which involved hydraulic control.

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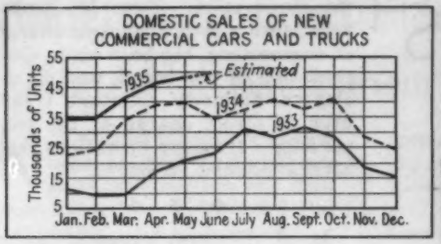
HENRY S. WRIGHT, president of the Lauson Co., New Holstein, Wis., reorganization of John Lauson Mfg. Co., manufacturer of gasoline and kerosene engines, tractors, pumps, and conducting a general foundry and machine shop business, has announced the following appointments: WILLIAM M. JAMES, factory manager; H. C. RAWLINGS, production manager; ALFRED BOSMA, chief engineer; O. R. MUELLER, director of experimental and research department; HUGO AGGEN, machine shop superintendent; OSCAR DUMKE, foundry superintendent.



THIS WEEK ON THE

Midsummer Car Production Pace Pleases Makers

DETROIT, July 30.

MOTOR vehicle retail sales are sidling along on an even keel—not quite up to the chipper rate of last month but still quite satisfactory for midsummer. In fact they have remained remarkably steady in the face of seasonal influence and the waning of the current model season. It is still too early for new model talk to have an important effect on demand, although some dealers say that this deterrent is beginning to take hold.

Such figures as have been reported to date indicate a domestic retail volume about 6 per cent under that of June, when an estimated 325,000 cars and trucks were delivered. Retail sales are now eating into dealers' stocks, since production this month for both domestic and foreign markets should not run much in excess of 300,000 units. When exports are deducted from this figure, it indicates a pretty fair reduction in dealer inventories during July. But the big bite into field stocks will be made in August when probably a majority of the plants will be closed for all or part of the month, some for inventory and vacations, but most of them for change-over to new models.

While Ford is expected to close the Rouge plant during the last half of the month, a good-sized schedule has been set up for the first half. Pontiac is rushing through on its current run of cars and probably will be down most of August. Oldsmobile likewise is expected to close early next month, since it has the big task on hand of getting ready its new plant (the former Durant plant acquired this spring), in addition to the preparatory work for new models. Graham probably will close for only a week to give employees vacation.

No "Clean-Up" Problem this Year

There is every indication now that the industry will not have to experience any serious clean-up problem this year. In fact, if demand keeps up some dealers will have empty shelves before the new model season. There are certain to be shortages on a number of body types; some stocks already are unbalanced. One of the leading sales organizations has only a month's supply of cars in the field and another group of dealer bodies anticipates a complete clean-up. That will help the few who might find themselves in a less fortunate position. It will also permit dealers to concentrate on their used cars and by liquidating these stocks put themselves in a stronger financial position to face the new model season.

Used car sales have been holding up as well or better than new car sales. The latter generally reaches a seasonal peak later than the new cars. While a number of companies report that their dealers' stocks are coming down, they are still higher than they want to see them and pressure is constantly being exerted on retail outlets to move used cars. A company in the medium-price field is cooperating with its dealers on a newspaper advertising campaign for used cars, offering to share the expense provided certain requirements, such as reconditioning, proper pricing and sales promotion, are complied with.

Judging by the expansion plans undertaken by many of the motor companies, further increase in automobile business is anticipated for next year. Plymouth, Chevrolet, Dodge truck, Oldsmobile and others have announced plans for increasing production facilities. Now, the latest move is by Fisher Body Corpn., which has just acquired the Murray Wood Products plant in Memphis, Tenn. This is the plant built by Murray Corpn. in 1929, which after a two-year run on body work, was converted into a furniture factory when steel bodies became more popular. Murray is now abandoning its furniture operations. The plant has 360,000 sq. ft. of floor space, including 30 lumber kilns and occupies a 44-acre tract. It will provide additional kiln-drying facilities for Fisher and will also be used for storage and for minor manufacturing operations. Beyond this, no considerable expansion of activities in Memphis is contemplated at present. Operations of the present Fisher body mill there will not be affected by the acquisition of the new plant.

A plant for production and development of liquid-cooled aircraft engines is to be constructed for Allison Engineering Co., division of General Motors Corpn., at Indianapolis. The engines which are rated at 1000 hp. are said to have been under development for several years.

The Indianapolis Motor Speedway, scene of the annual 500-mile automobile race, is to be completely remodeled in anticipation of greater speeds and motor improvements in the future. Work on the 2½-mile brick track will be started at once

ASSEMBLY LINE

and will be completed before winter. Approximately $100,000 is being spent.

Chrysler Doubles Profits

Chrysler Corpn. translated its big shipment figures into dollars and cents the other day when it reported for the first six months of 1935 a net profit of $18,659,309, or $4.31 a share on capital stock, more than double the $8,192,984 earned in the first half of 1934. That the corporation enjoyed a better profit margin this year is indicated by the smaller percentage gain in dollar volume of sales, which was up roughly 28 per cent to $295,569,896 from $231,103,779 for the first half of last year. An extra dividend of 25c. in addition to the regular quarterly dividend of 25c. was declared, both payable Sept. 30 to stockholders of record Sept. 3.

Chrysler directors approved expenditures of $7,000,000 for rounding out facilities and for plant conditioning and tools.

Briggs Motor Bodies, Ltd., of England, subsidiary of Briggs Mfg. Co., is understood to have completed financing of an issue of £1,000,000 4½ per cent first mortgage debentures at 103 and 400,000 shares of common of £1 par each at 25s. a share to be issued shortly. This financing of its English subsidiary by British capital will return to the parent company an investment amounting to around $5,000,000. The English plant was established in 1930 to supply the Ford Dagenham plant with bodies, but in addition it has enjoyed an increasing amount of business from English motor car manufacturers and has been forced to expand its facilities. Control is to be retained by the American company.

Since the new management assumed control of Hupp Motor Car Corpn., about 90 days ago, average monthly production has exceeded the average for the 35 months previous by 656 cars a month. May output of 1552 cars set a three-year record, and June production was the largest for any June in four years. June exports were the heaviest in six years. Since the first of the year, Hupp's field organization has been augmented by eight new distributers and 112 new dealers, making the present number the largest in 31 months. Sales for the first half of 1935 exceeded the first seven months of 1934.

Packard Does Well with "120" Model

The success of its "120" model, introduced early this year, has lifted Packard out of the red, its statement for the first half of 1935 showing a net profit of $290,460 against a net loss of $2,968,144 in the first six months of 1934. The June quarter profit of $1,500,622 was partially absorbed by a loss in the first quarter this year. Due credit for the better showing must also be given Packard's Twelfth Series cars which showed substantial gains over last year and played an important part in bringing the company back into black ink. But the lion's share of the credit belongs to the new smaller car, for which demand has been so insistent that steadily increasing schedules have been made necessary. On Jan. 1 this year, the factory that was set aside for its production was still vacant space and most of the machine tools and facilities had still to be received from the manufacturers who produce them. There was considerable delay because many of the tools were special and others were entirely new in principle. The first "120" was produced through Packard's regular manufacturing facilities on Feb. 16, 1935, and output by months has been as follows: February, 67; March, 2251; April, 4358; May, 5069, and June, 6071. Total production of these cars by the end of June was 17,816. Meanwhile 3561 of the Twelfth Series cars were turned out.

Increased capacity for its extrusion division is being planned by Bohn Aluminum & Brass Corpn., which has asked for bids on an addition to this plant.

An idea of the trend of retail sales of automobiles may be had from the weekly reports of the various Chrysler divisions. For the week ended July 20, Plymouth delivered 8736 cars, Dodge 3968 passenger cars and 1137 trucks, DeSoto 696 and Chrysler 935. This compares with preceding week's deliveries of 8810 Plymouths, 4005 Dodge passenger cars and 1174 trucks, 610 DeSotos and 1001 Chryslers.

General Motors was able to show a good gain in operating results during the second quarter despite its strike troubles which fell in that period, substantially curtailing Chevrolet's production in May. Net earnings jumped to $52,219,467 from $40,267,000 in the June quarter last year, and the six months net of $83,729,838 this year compares with $69,586,613 for similar period a year ago. Share earnings on common stock were $1.85, of which $1.17 represented second quarter results.

Detroit Notes

Contrary to earlier expectations good tonnage is coming in from motor companies. Much of it on new models but also a considerable volume on current lines. Evidently car manufacturers have developed sizes more quickly than they anticipated since volume of steel orders placed in last half of July was not expected until August. Then too placing of new business has been facilitated by relatively small changes in specifications this year. These factors cut short the summer slump confining the extremely dull period to only about two weeks around July 1. New model tonnage is quite general throughout the industry indicating that car makers are keeping abreast of each other in the new car programs.

ANNOUNCING.....

THREE NEW DIE SINKING CUTTERS

FOR HIGH SPEED DIE SINKING MACHINES

These three new die sinking cutters are designed for the higher speeds and feeds of modern die sinking machines. In particular they are used in the P&W No. 2A Universal Die Sinker, with spindle speeds up to 3600 R.P.M. They are the only cutters needed for that machine for either straight or cherrying cuts.

Try these new cutters in tough die blocks. Step up the speed. Boost the feed. They will perform beautifully and cut much faster in the new die steels. They are equal or superior to any die sinking cutters available today.

These new cutters are made of high speed steel, and have straight shanks. They are regularly furnished with right-hand cut and right-hand spiral flutes. Their flute design and chip clearances are suitable to render maximum efficiency under varying conditions.

We have just completed a circular describing these new cutters, and listing the sizes available. A letter to our nearest branch office or directly to Hartford will bring your copy by return mail. Our branch offices are located at Birmingham, Boston, Chicago, Cincinnati, Cleveland, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, Rochester, St. Louis and San Francisco.

PRATT & WHITNEY CO.

HARTFORD, CONN.

THIS WEEK IN WASHINGTON

Most popular song in Congressional circles just now is "Show Me the Way to Go Home."

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Senate resists administrative whip cracking in connection with banking bill.

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Attack on bigness forwarded in Congress through committee adoption of "Soak the Rich" bill.

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President states that charity must begin—and end—at home. Is solicitous of stockholders' rights.

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O'Neill, of NRA, joins business men's exodus from Washington.

o o o

By T. H. GERKEN

News Editor, The Iron Age

(Substituting for Washington Editor, on Vacation)

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WASHINGTON, July 30.—Dog days are here! And dog days in Washington are not for mere Pekinese. They are for big, strong, lusty St. Bernards! For the average human being, they are a little too much, and even the members of the seventy-fourth Congress of the United States of America find the prospect of an endless procession of such days, extending even into the Indian summer, a little disconcerting.

But what can the Congress do? It can't go home. There is too much "desirable" legislation on its docket that can't wait. And, after all, the seventy-fourth Congress has never made up its collective mind whether or not the legislative branch of the Federal Government is centered at the Capitol or the White House. So the battle goes on, with the so-called legislative branch more and more ill-humored, and the executive department just as determined to write the nation's laws as well as to administer them.

The one branch of the Government which doggedly clings to its normal function, that being, of course, the judicial, has long since finished up its pressing business and gone away for the summer. But they of the Supreme Court will be back when dog days are over, and the great mass of the American people will be only too grateful to have them sit in judgment upon much of the fanatically inspired dog days legislation.

Only on rare occasions does the present Congress rise up to demand its normal prerogatives. Such an occasion was the passage by the Senate last week of the omnibus banking bill which was sent to conference with the House in exactly the same form as reported by the Senate banking committee. This committee is probably unique in the seventy-fourth Congress, being dominated by one of its own members rather than by the White House. That member is the senior Senator from Virginia, the venerable Carter Glass, who has had the temerity to differ with the White House on numerous occasions, and who skillfully led the banking bill through the Senate without a single alteration to meet the demands of the Roosevelt-appointed Governor of the Federal Reserve Board, Marriner S. Eccles.

Senate Regains Some Backbone

Of course, the banking bill has not yet become law, but its passage by the Senate recouped a little of that body's traditional dignity. Demagoguery was at a minimum, and an amendment to create a central bank, which was sponsored by Father Charles E. Coughlin, was defeated by a vote of 59 to 10. The real fight on the bill will come in the conference with the House committee where the conservative elements of the Senate will be lined up against the Administration-dominated House majority. Whether he favors the Senate version of the bill or not, the average man cannot help but admire the valiant fight of the 77-year-old Senator from Virginia and hope that he is able to uphold the principles of representative government which he so ably champions.

The Senate's record on the passage of the AAA amendment bill was not so distinguished, but the legislation as passed was considerably altered from the radical form originally urged on Congress by the Secretary of Agriculture. The Senate bill is expected to meet with

little difficulty in conference with the House, and while it adds greatly to the powers of the Secretary, the efforts of its sponsors to secure price fixing provisions were effectively blocked.

Debate on this bill lasted for two weeks and developed many bitter controversies. Reciprocal trade agreements were attacked by members of both parties, but all attempts to restrict the power of the State Department in negotiating such treaties were defeated.

It was quite evident from the debate on the trade agreements, however, that many members of the Senate would like to have returned to them the time-honored privilege of ratifying treaties with foreign powers which they thoughtlessly surrendered in the days of the Roosevelt "honeymoon." In this connection, it is interesting to recall that the Brazilian Congress had not yet ratified the Brazilian-American reciprocal agreement. Considerable opposition to the treaty has arisen in that South American republic because advantages of the treaty would automatically be extended to other countries under the most-favored-nation arrangements of the State Department. Brazil, it seems, had not fully understood this angle, and can see no particular advantage in reduced duties on manganese, for instance, if the same reductions are granted to Russia.

Other doings on Capitol Hill were of less consequence. Various investigations were continued. Lobbyists were pursued to the far corners of the nation and even into the hereafter. Unfortunately, however, the sender of a telegram who was at first thought to have been deceased turned up to dispute the fact, to the relief, apparently, of a large public utility company.

The Virgin Island Operetta

The investigation of the Virgin Islands, which has been much the best show in town, was finally brought to a close by Presidential intervention. Governor Paul Pearson and United States District Judge T. Webber Wilson "resigned," and room was found for them both in other Federal departments. Dr. Pearson went quietly into the FHA, which always has room for another administrator, but a member of the Federal Parole Board had to be removed before Mr. Wilson could be placed there. It mattered little that it had to be Dr. Amy N. Stannard, psychiatric expert and non-political appointee with little poltical influence. Although considered a highly competent public servant, Dr. Stannard was not calculated to be able to raise much of a fuss, and she didn't. Unfortunately, many disinterested parties did, and the country was again treated to the full details of political preferment in its most obnoxious form.

The far-famed utility bill remained in conference all week. The committees met several times, but always on hand was Benjamin Cohen, the President's personal lobbyist, whose presence certain members of the committee objected to. Mr. Cohen stood pat and so did his enemies. It is now reported that some of the large utility companies feel that they, too, should be allowed to have lobbyists present at the committee hearings. This would seem entirely right and proper.

The "Soak the Thrifty" Bill

The House Ways and Means Committee finally completed the drafting of a "share the wealth" tax program which can't possibly satisfy anyone. Under the most liberal estimates it might raise $250,000,000 a year to meet $3,000,000,000 deficits. The bill will be placed before the House next week and at the same time the Senate Finance Committee will begin hearings on proposed tax legislation.

The House bill followed the President's proposals rather closely regarding increased taxes on large incomes and graduated inheritance and gift taxes, but proposed increased excess profits taxes and graduated corporation income taxes as contrasted with flat income taxes for corporations as demanded by the President. The graduated tax on corporate income would begin with a tax of 13¼ per cent on net incomes of $15,000 or less and 14¼ on incomes of more than $15,000, replacing a tax of 13¾ per cent on all net corporate income. This is scarcely calculated to satisfy the President's keen desire to penalize bigness as proposed in the earlier tax program.

The President entered the tax controversy only on the subject of exemption from Federal income taxes of gifts by corporations for charitable purposes. This practice, he characterized as the purchase of good will, and apparently the big bad corporations, especially the public utilities, have no right whatever to buy good will. That prerogative, however, is not denied to political parties, and $4,000,000,000 is certainly not too much to spend.

Charity Begins at Home—and Ends There

This stand on the part of the President brought sharp criticism from representatives of organized charity, who stated that corporation gifts account for approximately 25 per cent of their annual income. The controversy will unquestionably continue in accelerated form as the tax bill makes its weary way through a tired and irritable Congress.

The weariness and irritation of Congress were more manifest than ever last week as bitter personal controversies broke out on the floors of both houses. Congressman Fish apparently suggested the impeachment of the President and finally extended the privilege to all the leading members of the Administration. His suggestion was not followed.

Senator Borah set the date for the adjournment of Congress at Nov. 1. He indicated that members of Congress had "must" legislation, which was just as important as the President's and were willing to stay around to see it passed. This outbreak of gross insubordination brought forth no comment from the White House, which is air-conditioned.

The various alphabetical agencies are now mourning in earnest over the slow death of the NRA. With its thousands of employees gradually being turned back to their political sponsors, new jobs must be found for them and with Boss Farley, from whom all blessings flow, on his way to Hawaii, the situation has become quite acute. The employees of the more fortunate bureaus which still exist must move over and make room for their less fortunate brothers and sisters of NRA. No wonder there is weeping and wailing at the bier of the recovery administration, whose most optimistic promoters have now practically despaired of getting it a Congressional shot in the arm at this session.

Of course the administration of the public works funds is providing quite a few jobs. Harry Hopkins has named boondoggling administrators for music, art, drama, and literature. The program for writers calls for production of an official American guide book. It will be interesting to read the chapter on Washington—if it is ever written.

Perhaps a guide to the innumerable alphabetical agencies created by an Administration which pledged itself to the reduction of Federal expenditure would occupy the writers for many man-hours. Even then, they might overlook the palatial new quarters of "Rex the Resettler" in the famous McLean mansion. For Mr. Tugwell, with

his resettlement administration, has outdone them all. He has retired with his $98,000,000 to the aristocratic elegance of Massachusetts Avenue, and there, to the gentle accompaniment of soft music from the famous McLean pipe organ, it should be easy for him to contemplate the problems of resettlement. In that wooded loveliness, only the pipes of Pan are lacking.

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Extra! Extra! Coal Strike Again Postponed!

Again the conciliatory genius of Madame Secretary Perkins has triumphed! Again the great heart of Czar Lewis of the United Mine Workers of America has timed its beat with the public interest! Again friendly letters have been exchanged between the chief executive of the land and the bituminous operators and miners of the Appalachian field! For the fourth time an eager public has been assured that the nation's miners have postponed that "bitter fight for their existence"—this time until Sept. 16.

At the same time, Mr. Lewis felt called upon to administer a gentle rebuke to a procrastinating Congress which has been so very busy with the passage of what the White House now likes to refer to as "desirable" legislation, that it has not yet had time to write Mr. Lewis' Guffey bill into the law of the land. And it is the Guffey bill which the President wants passed despite any doubt as to its constitutionality. It is the Guffey bill which must if necessary supersede the Constitution of the United States. Why? Because the Guffey bill is desired by the American Federation of Labor and by the United Mine Workers of America.

Those two great organizations are above the accusation of lobbying. It is difficult to understand why they should be immune, but perhaps it is because they virtually stand for the executive branch of the Government when matters involving labor legislation are involved.

Of course, Mr. Lewis is not yet really angry because the Guffey bill has not been passed. He is only slightly annoyed, because he knows the bill MUST pass. "At an early date," he said, "in the public interest, the Congress should dispose of this legislation, favorably, if it will, unfavorably if it must. The uncertainty should be ended before Sept. 16, and if there is nothing ahead of the mine workers but a bitter fight for their very existence, it may as well come on Sept. 16 as at any other time. This is the fourth extension. Surely it should be enough!"

The restraint exercised by Mr. Lewis in this statesman-like manifesto can be questioned only by the most heartless tories!

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O'Neill Leaves NRA; Agency's Future in Doubt

James L. O'Neill, vice-president of the Guaranty Trust Co., New York, and former Carnegie Steel Co. official, who has been acting National Recovery Administrator for the past two months, has resigned, effective Aug. 1. His successor will probably be named this week and Mr. O'Neill indicated that it will probably be someone from within the NRA organization.

Mr. O'Neill's leaving the NRA again raised the question of the future of that agency, and the view prevails in Washington that most of its practical functions will eventually be transferred to the Federal Trade Commission. It is not believed, however, that any definite action will be taken at this session of Congress and that the skeleton set-up now in existence will be continued.

President Roosevelt stated that he had given no further thought to additional legislation to give the trade commission more authority over the establishment of voluntary code agreements for individual industries, although it has been reported that plans are being considered to provide exceptions from the anti-trust laws in the case of some groups.

Imports Off In June

WASHINGTON, July 30.—Declining 14,511 gross tons, or 30.4 per cent, imports of iron and steel in June, according to preliminary figures, totaled 33,208 tons, compared with 47,719 tons in May. There were some mild increases in finished lines, but they were offset by the sharp drop in incoming shipments of pig iron, which fell to 6583 tons in June, against 23,174 tons in May.

Imports of plain shapes decreased to 3164 tons from 3519. Of the June imports of plain shapes, 2586 tons came from Belgium, 505 tons from France and 73 tons from Germany. Scrap imports in June were 2417 tons, of which 2411 tons came from Canada. Imports of hoops and bands totaled 2517 tons, of which 1826 tons came from Belgium, 332 tons from Germany, 225 tons from the United Kingdom and 125 tons from France. Sheet imports were 1286 tons, of which 635 tons came from Belgium and 599 tons from Germany. Imports of pipe, other than welded material, were 3174 tons, of which 2059 tons came from Germany and apparently consisted chiefly of seamless tubes. Incoming shipments of merchant and other steel bars totaled 1511 tons, of which 753 tons came from Belgium, 348 tons from Germany, 291 tons from Sweden and 93 tons from France. Imports of reinforcing concrete bars were 300 tons, all coming from Belgium.

Imports of ferromanganese and spiegeleisen aggregated 4153 tons, 1565 tons coming from Norway, 1374 tons from Canada, 630 tons from Germany, 352 tons from France and 199 tons from the United Kingdom. Manganese ore imports were 11,235 tons, of which 9186 tons came from Soviet Russia, 1311 tons from the Gold Coast of Africa and 701 tons from India. Of the imports of pig iron, 2952 tons came from India, 1364 tons from the Netherlands and 1050 tons from the United Kingdom.

Allegheny Steel Adds New Alloy

A NEW alloy steel which expands under heat at the same rate as glass has been added to Allegheny Steel Co.'s line of stainless, electrical and other special steels, W. F. Detwiler, executive vice-president, announced today. At approximately $2 per pound, it is the highest priced alloy in the company's line.

Production of the new metal, fernico, has started at the rate of 15,000 lb. a month. Its first commercial application was its use for electrical connections in the base of the new metal radio tubes recently put on the market.

Michigan Program Approved

THE Michigan State highway department has received official approval of its bridge and grade separation program under the Federal works relief act. Included are 13 highway bridges to cost $597,000 and 35 grade separations estimated to cost $6,345,000. It is expected that these projects will be up for bids by Nov. 1.

President Denies Full Protection Against Foreign Competition on PWA Jobs

WASHINGTON, July 30.—Virtually declaring himself in favor of the purchase of foreign steel for public works jobs if foreign bids are 15 per cent below domestic tenders, President Roosevelt, in his press conference last Friday, temporarily closed the door to further relief from a recent public works department order to which the steel industry had made vigorous protest.

In stating his position, the President pointed out that the steel industry is protected by high tariffs which were written before the advent of the present Administration and which had been considered high enough to overcome the handicap of foreign wage levels and manufacturing costs in competition encountered by American producers. He added that the awarding of contracts to American bidders unless foreign tenders are more than 15 per cent lower, in effect, gives American producers an additional 15 per cent tariff protection.

The President's attention was not called to the recent lowering of American tariffs on steel products by the Belgian-American and Swedish-American trade agreements. At the same time he had no further comment to make regarding the objections to the 15 per cent ruling recently voiced by Eugene G. Grace, president, Bethlehem Steel Corpn., who contended that the practice would only add to unemployment in the steel industry.

Treasury Department Requires 25 Per Cent

In the face of official protests from the American Iron and Steel Institute, the Federal Emergency Administration of Public Works had given no intimation of rescinding its Administrative Order No. 27 when the President stated his position. Adding further confusion to the situation, however, was an order by the procurement division of the Treasury Department which fixed the preference in favor of domestic materials at 25 per cent. Admiral C. J. Peoples, chief Government procurement agent, stated that "we believe that the 25 per cent differential protects American industry from the competition of cheap foreign labor and from all other adverse factors." Another official of the department was quoted as not knowing why the PWA has seen fit to cut the differential to 15 per cent.

The order of the procurement division provides that on purchases where the foreign bid exceeds $100 a differential of 25 per cent will apply. The order is also believed to be designed to conform with the joint resolution of Congress setting up the $4,880,000,000 works relief fund. Section 13 of this resolution provides that "the acquisition of articles and materials and supplies for public use, with funds appropriated by this joint resolution shall be subject to the provisions of section 2 of Title III of the Treasury and Post Office Appropriation Act for the fiscal year 1934; and all contracts let pursuant to the provisions of this joint resolution shall be subject to the provisions of section 3 of Title III of such act."

The sections of the act referred to are as follows:

SEC. 2. Notwithstanding any other provision of law, and unless the head of the department or independent establishment concerned shall determine it to be inconsistent with the public interest, or the cost to be unreasonable, only such unmanufactured articles, materials, and supplies as have been mined or produced in the United States, and only such manufactured articles, materials, and supplies as have been manufactured in the United States substantially all from articles, materials, or supplies mined, produced, or manufactured, as the case may be, in the United States, shall be acquired for public use. This section shall not apply with respect to articles, materials, or supplies for use outside the United States, or if articles, materials, or supplies of the class or kind to be used or the articles, materials, or supplies from which they are manufactured are not mined, produced, or manufactured, as the case may be, in the United States in sufficient and reasonably available commercial quantities and of a satisfactory quality.

SEC. 3. (a) Every contract for the construction, alteration, or repair of any public building or public work in the United States growing out of an appropriation heretofore made or hereafter to be made shall contain a provision that in the performance of the work the contractor, subcontractors, material men, or suppliers, shall use only such unmanufactured articles, materials, and supplies as have been mined or produced in the United States, and only such manufactured articles, materials, and supplies as have been manufactured in the United States substantially all from articles, materials, or supplies mined, produced, or manufactured, as the case may be, in the United States except as provided in section 2: *Provided, however,* That if the head of the department or independent establishment making the contract shall find that in respect to some particular articles, materials, or supplies it is impracticable to make such requirement or that it would unreasonably increase the cost, *an exception shall be noted in the specifications as to that particular article, material or supply, and a public record made of the findings which justified the exception.* (Editor's note: The italics are ours.)

It can thus be seen that the intent of Congress in this connection was quite clear and the question is naturally raised as to whether both the PWA and the procurement division of the Treasury Department are not overstepping their legal prerogatives in setting up arbitrary price differentials.

PWA Order Most Objectionable

The PWA's Administrative Order No. 27, to which the principal objections of the steel industry are leveled because of the large amount of business which might be affected, reads as follows:

The Administration has determined to adopt for non-Federal projects, as a regulation, the terms of a statute (Public No. 428, 47 Stat. 1520) heretofore adopted by the Congress for Federal projects. You are, therefore, directed to require that the following provision be made a part of the construction regulations to be inserted in the appropriate contract document for all contracts for which advertisements for bids are submitted for your approval after June 15, 1935:

> "Domestic materials—In the performance of this work the contractor, subcontractors, material men, or suppliers shall use only such unmanufactured articles, materials, and supplies as have been mined or produced in the United States, and only such manufactured articles, materials and supplies as have been manufactured in the United States substantially all from articles, materials, or supplies mined, produced, or manufactured, as the case may be, in the United States, except as provided in the specifications."

The plans and specifications shall contain a copy of the schedule attached hereto in which is set forth the differentials in favor of domestic materials. Regardless of the kind of material involved, if the cost of the domestic material covered by any one material contract or purchase order exceeds the cost of foreign-made material of equal quality and quantity by any amount in excess of the approved differential, the foreign material *must* be purchased if the purchaser is the borrower, and *may* be purchased if the purchaser is a contractor. (Editor's note: The underscoring occurs in the order.)

It is hereby directed that, in deciding the reasonableness of cost of domestic products, the following differential scale shall be applied in favor of domestic articles, materials or supplies:

> On purchases where the foreign bid is $100 or less, a differential of 100 per cent will apply.

On purchases where the foreign bid exceeds $100, but is less than $10,000, a differential of 25 per cent will apply.

On purchases where the foreign bid is $10,000 or more, a differential of 15 per cent will apply.

A solution to the entire controversy may be provided if the Walsh bill providing conditions for the purchase of supplies and the making of contracts, loans or grants by the United States is enacted by Congress.

The bill reads in part as follows:

That in connection with all or any purchases of or contracts for construction, articles, materials, supplies, equipment, or services, except professional services, made, extended, or modified hereafter, by any executive department, independent establishment, or other agency or instrumentality of the United States, by the District of Columbia, or by any corporation which now is or may hereafter be owned, managed, or controlled directly or indirectly by the United States (all of the foregoing being hereinafter designated as "agencies of the United States"), there shall be required to be included in the proposal or contract a representation or agreement that all persons in classes of employment described specifically or by reference in the invitation to bid, while engaged in the carrying out of the contracts or in the production or furnishing of articles, materials, supplies, equipment, or the furnishing of services in connection therewith, have since the approval of this act been paid not less than such minimum rates of pay and employed not to exceed such maximum hours as were specified in the approved codes of fair competition promulgated pursuant to section 3 (a) of the National Industrial Recovery Act approved June 16, 1933, and in effect on May 26, 1935, applicable to their respective trades or industries, and they will be paid not less than such minimum rates of pay and employed not to exceed such maximum hours as shall be designated specifically or by reference in the invitation to bid, and that no person under 16 years of age and no convict labor has been or will be employed in the carrying out of the contracts of the production of articles, materials, supplies, equipment or the furnishing of services in connection therewith.

That Government departments expect the Walsh bill to become a law is indicated by a recent circular letter issued by the procurement division of the Treasury Department which includes the following clause:

Bids are requested on the basis that if subsequent legislation shall require observance of minimum wages and/or maximum hours of employment and/or limitation as to age of employees, in the performance of Government contracts any contract entered into shall be subject to modification to accord with such statutory requirements to the extent authorized or required by law.

Bethlehem Ends Second Quarter With Profit of $1,800,909

E. G. Grace Attacks Government Order Forcing the Purchase of Foreign Steel for Public Works

WITH operations averaging 38.6 per cent of capacity during the second quarter, Bethlehem Steel Corpn. closed the period with a net income of $1,800,909, as compared with a deficit of $607,298 in the first quarter, during which time operations averaged 39.1 per cent. This lack of correlation between financial return and operations is attributed to a heavier liquidation of stocks and a clearing up of contracts during the second quarter. Operations during the second quarter a year ago averaged 51.8 per cent and a profit of $3,441,642 resulted. The good showing in the second quarter of this year enabled directors to declare a dividend of $1.75 per share on the preferred stock, payable Oct. 1, to stockholders of record on Sept. 6.

The estimated value of orders on hand June 30, 1935, was $49,589,474, as compared with $57,202,828 at the end of the previous quarter and $70,438,890 on June 30, 1934.

In his usual discussion of business conditions, Eugene G. Grace made no prediction as to what may be expected in the way of operations during either the third or fourth quarter. Mr. Grace, however, attached considerable significance to the present high operating rate of the industry, based as it is almost wholly on miscellaneous demand with little or no support from heavy consumers.

Mr. Grace announced that the Sparrows Point, Md., plant is now installing a new continuous cold strip mill for the production of tin plate. This installation will cost $5,000,000, and Mesta Machine Co. is building the equipment. It is expected that the new continuous hot sheet mill at Buffalo will be in operation by the first of the year. Part of the output of this mill will find an outlet in the Detroit area as shipments can be made by water.

Mr. Grace was considerably concerned over the possibility that Eastern steel mills may not benefit to any great extent from the spending of the recently appropriated $4,800,000,000 public works fund. A Government order (see THE IRON AGE, July 18, page 52) has been circulated among recipients of this money instructing them that foreign steel must be purchased in all cases where the foreign bid is $10,000 or more and it can be secured at a cost 15 per cent less than domestic steel. Mr. Grace cited wage rates in European steel centers to show that such an order may mean a reduction in unemployment abroad rather than a reduction in this country. The present wage of domestic steel workers is 7 per cent above that of 1929, and the average pay in May was 65.5c. per hr., in England it was 25.5c., in Belgium 17c., and in Germany 25.9c. Thus European steel can be produced much more cheaply, and this low-priced material may find an outlet in many public works projects. The American Iron and Steel Institute plans to fight this Government ruling.

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ALFRED P. SLOAN, JR., president of General Motors Corpn., announces:

"Net earnings applicable to the common stock for the second quarter ended June 30, 1935 were $1.17 per share on the average common shares outstanding. This compares with earnings of $0.88 per share for the second quarter of 1934. For the six months ended June 30, 1935, net earnings applicable to the common stock amounted to $1.85 per share on the average common shares outstanding during this period. This compares with earnings of $1.51 per share for the six months ended June 30, 1934.

"Net earnings available for dividends, including equities in the undivided profits or losses of subsidiary and affiliated companies not consolidated, for the second quarter ended June 30, 1935 amounted to $52,219,467, compared with net earnings of $40,267,090 for the second quarter of 1934. After deducting dividends of $2,294,555 on the preferred stock, there remains $49,924,912, being the amount earned on the common shares outstanding, which compares with earnings on the common stock of $37,972,535 for the second quarter of 1934.

"Total sales of cars and trucks to dealers, including Canadian sales, overseas shipments and production from foreign sources, during the second quarter ended June 30, 1935 amounted to 499,344 cars and trucks, compared with 433,672 cars and trucks in the corresponding quarter of 1934—a gain of 66,172 units, or 15.3 per cent. General Motors dealers in the

United States delivered to consumers 390,742 cars and trucks during the second quarter of 1935, compared with 314,449 cars and trucks in the corresponding quarter of 1934—a gain of 76,293 units, or 24.3 per cent. Sales by General Motors operating divisions to dealers within the United States during the second quarter of 1935 amounted to 408,968 cars and trucks, compared with 344,597 cars and trucks in the corresponding quarter a year ago—a gain of 64,371 units, or 18.7 per cent."

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REPUBLIC STEEL CORPN. and subsidiaries showed a net profit of $922,329 for the second quarter of 1935, as compared to a net profit of $1,834,235 for the first quarter of this year, and a net profit of $864,125 for the second quarter of 1934, according to the company's consolidated income account made public today.

For the first half of the year, Republic showed a net profit of $2,756,564 as compared to a net profit of $805,443 for the first half of 1934.

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UNITED ENGINEERING & FOUNDRY CO. declared an initial quarterly dividend of 25c. a share on the new $5 par value common stock and the regular quarterly dividend of $1.75 a share on the preferred, both payable Aug. 9 to record July 30. The dividend on the common stock represents an increased disbursement as in the previous quarter a dividend of 37½c. per share had been paid on the old no par stock which since has been split two-for-one. Prior to that the old stock had been receiving 25c. quarterly.

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BLAW-KNOX CO. reports for the six months ending with June 30, 1935, subject to confirmation by the auditors, a net profit of $301,448.06 after depreciation and provision for Federal income and the new State taxes. This compares with a net profit of $105,213.52 for the first six months of 1934.

Increased sales of industrial equipment are largely responsible for the improved showing. Irvin F. Lehman, president, states that sales to gas and power companies are considerably below normal due to the present policies of utilities companies, and that sales of road building and construction equipment are also subnormal. When the new Federal construction program becomes active an expansion in these latter activities is expected.

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CORRIGAN, McKINNEY STEEL CO., Cleveland, had a profit of $768,337 before depreciation and depletion, etc., in the fiscal year ending April 30, as against a profit of $729,050 before the same deductions in the previous year. After providing for depreciation, depletion, amortization and Federal income taxes and a net loss of $215,740 of the Newton Steel Co. applicable to minority interest, the net loss applicable to stock of the Corrigan, McKinney Co. was $1,216,277 as compared with $1,403,817 during the previous fiscal year. Operations during the fiscal year were 60.8 per cent of ingot capacity as compared with 69.8 per cent during the previous year.

Referring to the operations of the company's employees' representative and cooperative group insurance plans, William G. Mather, chairman of the board, and Donald B. Gillies, stated in a letter to the stockholders:

"The employees' representative plan has demonstrated its effectiveness for collective bargaining between employees and your company on all questions involving wages, employment, hours of work, working conditions, safety, sanitation and other matters of mutual interest.

"It is particularly gratifying that we are at this time able to report that the employees' cooperative group insurance plan, which was inaugurated on Nov. 18, 1933, has demonstrated the economic wisdom of group insurance. Our employees have that feeling of security, both at work and at home, that goes hand in hand with proper insurance protection."

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JONES & LAUGHLIN STEEL CORPN. and subsidiary companies report for the second quarter net income, after all expenses, reserves for depreciation and depletion, and interest on bonds, of $44,412, compared with net income in the second quarter last year of $886,252. The company sustained a net loss for the first six months of 1935 of $750,377, contrasted with deficit of $1,038,272 in the first half of last year.

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WESTINGHOUSE ELECTRIC & MFG. CO. reports for the quarter ended June 30 net profit of $3,938,692, compared with net profit of $1,744,427 in the second quarter last year. Net profit in the first half of 1935 was $6,265,188, contrasted with net loss of $31,725 in the first half of 1934. Orders received during the first six months of this year were 21 per cent higher than those booked in the first half last year; and for the second quarter were the highest since the second quarter of 1931. Sales billed during the first six months were 38 per cent higher than billings in the same period last year.

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SUBSTANTIAL increases in earnings for the first half of this year, as compared with the first half of 1934, were reported today by both the Edward G. Budd Mfg. Co. and the Budd Wheel Co.

Budd Mfg. Co., producer of automobile bodies and stainless steel trains, reported net earnings of $278,983, which, after preferred dividend requirements for the first six months, are equal to 7c. a share on the 994,912 shares of outstanding common stock. This compares with a profit of $64,766 for the first six months of 1934.

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FIRST half net profit of Budd Wheel Co. was $516,560, equal to 50c. a share on the common stock after allowing for preferred dividend requirements. This compares with a net profit of $148,609 in the first six months of 1934, which was equal to 12c. a share on the common stock.

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NATIONAL LEAD CO. reports income for the six months ending June 30, 1935 of $2,615,509.81. This compares with $2,066,755.33 for the corresponding period of 1934. Net earnings for the first half of this year, after deducting dividends on outstanding preferred stock, were $1,652,348.31 and compared to $1,103,627.08 for the first half of last year.

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UNITED STATES PIPE & FOUNDRY CO. reports total earnings for the six months ending June 30, 1935 of $810,964.94. After deducting for depreciation and Federal income tax reserve, the net profit was $468,335.99, compared to $315,727.30 in the corresponding period of last year.

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SHARON STEEL HOOP CO. reports net profit for the first half of 1935 of $540,866.85 after all deductions and Federal and State tax reserves.

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A. M. CASTLE & CO., reports net income of $87,000 for the second quarter, equal to 72c. a common share. This compares with $101,682, or 85c. a share in the corresponding period of 1934. All figures are after full allowance for depreciation and current income federal taxes.

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INTERLAKE IRON CORPN. reports net loss of $325,221 for the second quarter of 1935. In the corresponding quarter in 1934 net loss was $221,585. Net sales for the three months were $3,700,397, while profits before depreciation and special charges were $4,688.

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KEYSTONE STEEL & WIRE CO. reports estimated earnings at $1,150,000 for the fiscal year ended June 30, 1935. In a letter to the stockholders, W. H. Sommer, president, states, "Although final reports are not yet completed our figures show that earnings for the fiscal year should be approximately $1,150,000."

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CONTINENTAL CAN CO., INC., reports for the 12 months ended June 30, 1935, net earnings of $10,465,258 after all charges, including depreciation and deduction of estimated Federal income tax. These earnings, which are equivalent to $3.93 a share on 2,665,191 shares of $20 par value common stock outstanding, compare with similar net earnings of $9,059,662 or $3.40 a share earned in the corresponding 12 months' period ending June 30, 1934.

The report shows income for the 12 months to June 30, 1935, as $15,100,749 before the deduction of $2,524,510 for depreciation and $2,110,980 for estimated Federal tax. After deducting these items, net of $10,465,258 remained available for the common stock, the report concluded.

Must Charity Begin--and End--at Home?

By GEO. M. VERITY

Chairman, American Rolling Mill Co.

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IN the current news of July 24, President Roosevelt has expressed opposition to corporations assisting in the support of local, State or national service organizations that come under the head of charitable institutions.

Existing laws permit corporations to deduct from their earnings sums subscribed to the support of local hospitals or other community institutions classed as charitable, before calculating the amount due the government based on their earnings.

This law was passed, in all fairness, to prevent what would in reality be double taxation.

If a donor must pay taxes on sums subscribed for such necessary purposes, it would militate very much against the making of such appropriations.

The President does not agree that such deductions should be allowed for the simple reason that he does not favor corporations assisting in the support of such institutions. He is apparently opposed to the principle involved.

He gives two reasons for his announced opposition.

The first one is: that such subscriptions or donations on the part of a corporation are made to create public good-will, and he does not approve of the buying of public good-will in that manner.

His belief that support of charitable institutions on the part of a corporation is given for such a reason was based on the statement of the president of some unnamed public utility in a southern State, who had advised him that that was the basis of their gifts.

His second reason, as given, is the most astounding statement of the two, if not one of the most remarkable statements he has made during his term of office.

He says: A large number of people live on dividends from investments in corporations and he believed that those who get a living in that way should have the right to choose the form of charity they prefer to support rather than to permit the officers of the corporations in which they are stockholders to make such gifts for them. Now on the face of it that might seem to be a very reasonable statement but it does not bear careful analysis.

The astounding thing about this statement is that the President has, after two long years of supporting every conceivable sort of legislation that would prevent corporations from earning anything for their stockholders; after openly advocating plans and policies that would take from him who has and give to him who has not; after two years of absolutely ignoring that great army of forgotten men and women, the humble stockholder, he has finally admitted that such an individual does actually exist and that it is possible that he or she actually depends on their dividends for their economic existence.

Stockholders, one and all, should rejoice that out of the wilderness of social reform that permeates the atmosphere that they have finally been discovered, and that their administrators in Washington are actually interested in preserving the earnings of the corporations in which they are stockholders, so that such earnings can be paid to them in dividends.

If the stockholder in anything, or his or her rights as such, has heretofore had either recognition or consideration, it has not been recorded in the daily news.

Why this sudden interest in saving corporation earnings for dividends?

Another Straw in the Wind

To those who still must find the pay rolls of the nation and who must of necessity live in an atmosphere of fact and experience, rather than in the Elysian fields of social reform, this is simply further proof of the aims of the Administration's close advisers, experimenters in social reform and applied socialism, who have time and again made it clear that they favor a system of production for use and not for profit. Such a system can only end in complete government control.

Corporation managements have been charged with many shortcomings, the greatest of which has been that of incompetency and dishonesty, all the facts as recorded in the history of a very large majority of our American industries to the contrary notwithstanding.

Here is a case where corporation management is charged with having an improper motive when it appropriates stockholders' earnings in the support of the charitable institutions, now accepted as essential to present-day standards of civilization and of living.

There was a time when many corporation managements cared little or nothing for hospitals or other community service organizations, but out of the costs and tragedies of the greatest of all world wars, one great gain for civilization was made. As a result of the cooperative and patriotic efforts made in support of the war, corporations and business men together with the people of our fine American communities became more generally community minded than ever before in the history of the nation.

Industry, its employees and its stockholders were led to see that community service institutions which assisted in the development and maintenance of sound community life were absolutely essential to industrial peace and efficiency.

They came to see that the corporation as such had a distinct responsibility to the community and that through the meeting of that responsibility it could do much to help its working organizations and its stockholders.

A great majority of those who today carry the responsibilities of management are serving their stockholders and employees and the public to the best of their ability, in the face of the greatest number of handicaps ever known.

The great, outstanding misfortune of this period of attempted recovery has been the belittling and defaming of all those who represent the accomplishments of the past, and those who are still carrying the responsibility of employment and of the success of the great enterprises of the nation.

If corporations are to be relieved of their accepted responsibility to the communities which provide them opportunity to properly carry on their activities, our community service work, which embodies the greatest and most practical plan for providing and spreading social justice ever conceived, will be destroyed to the everlasting discredit and inestimable loss of the nation.

▲▲▲ Capital Goods

REFLECTING the brighter outlook which prevails in the heavy industries, THE IRON AGE capital goods index last week rose to 57.5 per cent of the 1925 to 1927 average for its third consecutive advance. This is the highest the index has been at any time since the third week of April, when it stood at 58.4. July of this year has thus shown a distinct improvement over the corresponding period in 1934, when the average rate of activity was approximately 16 per cent lower. Moreover, progress during the month has been steadily upward, whereas during July of 1934 conditions early became static.

A strong tendency to resist seasonal retardation is apparent, especially in the case of the steel and automobile components. The steel index, after seasonal adjustment, stands 31 per cent above the low point it reached during Independence Day week, while automobile production over the same period has increased by 20 per cent.

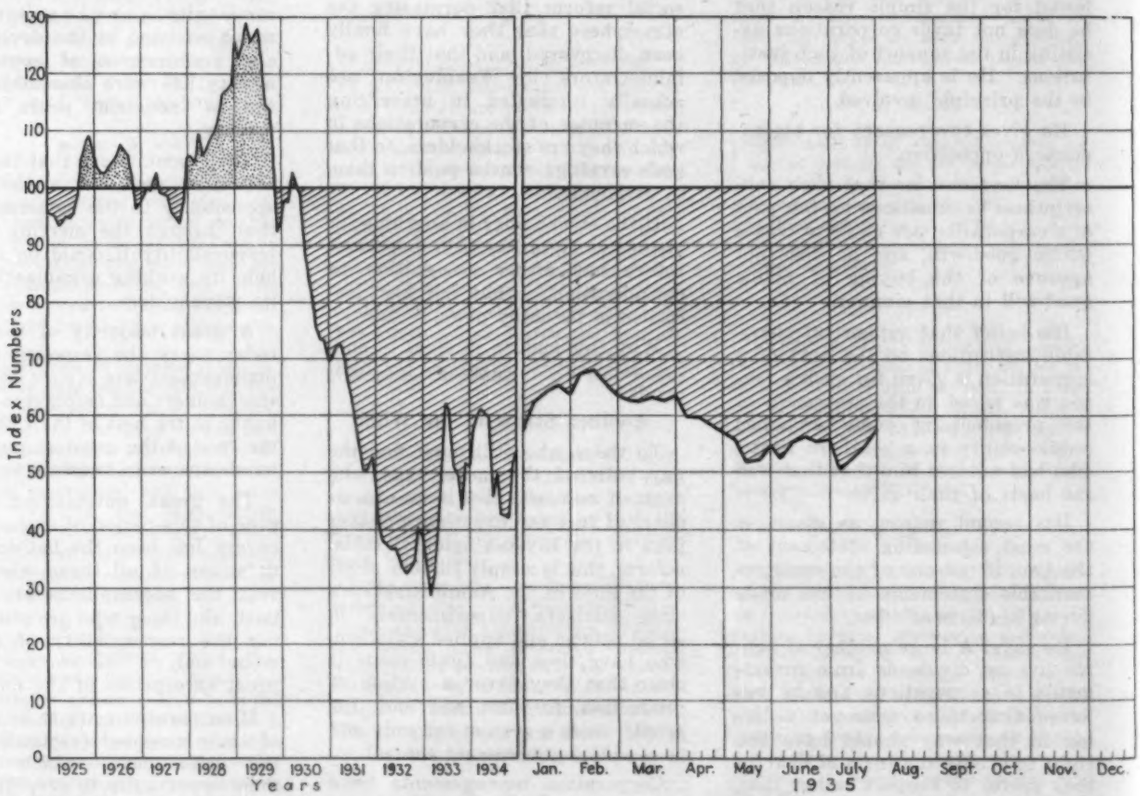
The Iron Age Weekly Index Numbers of Capital Goods Activity

(1925-27 Average = 100)

Last week (est.)	57.5
Preceding week (rev.)	55.7
Same week last month	55.2
Same week 1934	48.7
Same week 1933	65.0
Same week 1932	35.1
Same week 1931	61.8
Same week 1930	83.4
Same week 1929	129.5

Normal Price Relations Restored

Sharp and protracted price declines were characteristic of, and responsible for, the severity of the depression during its early phases, while the disproportionate extent to which the prices of various classes of goods and services had fallen has been one of the important factors responsible for the erratic and retarded course of re-



The Iron Age Index of Capital Goods Activity. The years 1925 to 1934 are plotted by months, the current year by weeks.

More Active ▲▲▲

covery in the United States. At the bottom of the depression, prices of most farm products and raw materials had fallen to a small fraction of their former levels, while many classes of manufactured goods, especially those affected by unyielding transportation rates, had suffered less severe declines. While hourly wage rates were well maintained during the early part of the depression, the reduction of working hours caused a sharp curtailment in average weekly earnings, which was made more difficult to bear by the slower decline in the cost of living. Dividends on common and preferred stocks were sharply reduced and in many cases eliminated, while corporate profits rapidly became negative quantities. Many elements of industrial operating costs, such as freight and power rates and taxes, were either not reduced or were actually increased.

The severity, and particularly the disparity, of price declines during the depression have been chiefly responsible for the insistent demand from many quarters for some kind of inflation designed to raise prices to their "normal" levels. Although there has been no official definition of what normal levels are, there has been a strong implication from the Administration that the restoration of 1926 prices was the goal toward which its various monetary experiments were aimed.

General price and wage recovery has now been under way, not only in the United States but in nearly all other countries of the world, for approximately two years. What is still more encouraging is the fact that the recovery has been correcting the disparities created by the depression and tending to restore the more normal relationships existing prior to the depression.

The chart at the bottom of the page shows the trend of indexes of wholesale prices, the cost of living and weekly earnings of factory workers during the past nine and a half years. These three indexes have been put on a comparable basis by computing the index number for each month as a percentage of the average for the year 1926. It is significant that these indexes have all now returned to a level about 20 per cent below that of 1926, so that almost exactly the same relationship exists among them as in that year. Wage-earners can buy as much with their weekly earnings as in 1926, and goods at wholesale are on a 1926 parity with goods at retail. Obviously it would be absurd to attribute any sacred significance to the absolute level of prices in 1926, but it is reasonable to suppose that in that year of prosperity a fairly normal relationship existed between wages, cost of living and wholesale prices. If this conclusion is sound no useful purpose can be served by further monetary experimentation designed to raise prices to higher levels. What capital and labor both need at present is freedom from uncertainties as to official policy and the opportunity to resume a normal volume of production and employment.

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CHART: WHOLESALE PRICES, COST OF LIVING AND WEEKLY EARNINGS (1926 average = 100)

Sources: Average factory weekly earnings and cost of living: National Industrial Conference Board; wholesale prices: United States Bureau of Labor Statistics.

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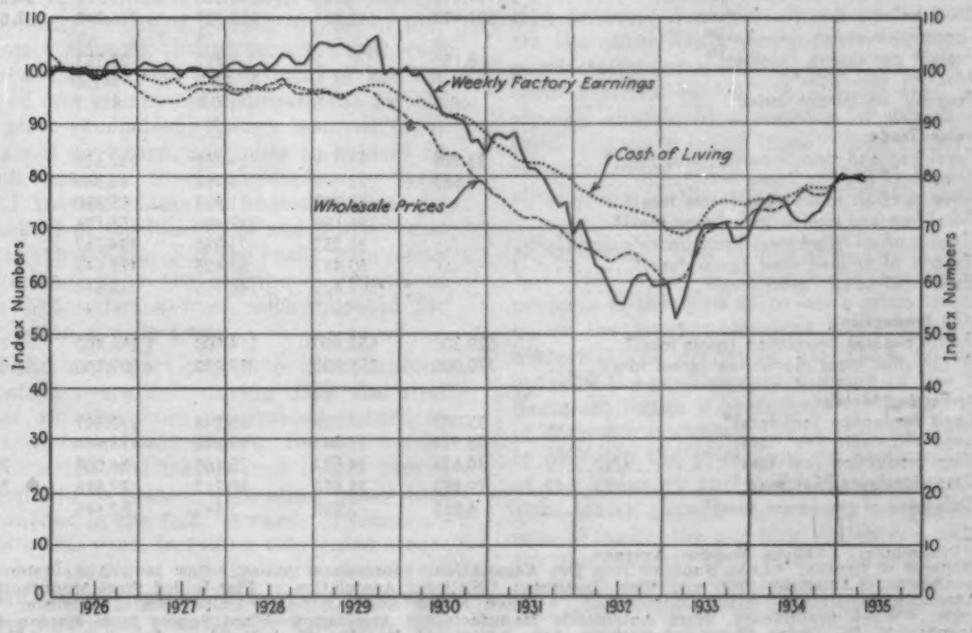


Current Metal Working Activity Statistically Shown

These Data Are Assembled By THE IRON AGE from Recognized Sources And Are Changed Regularly As More Recent Figures Are Made Available. Boldface Type Indicates Changes This Week

	June, 1935	May, 1935	June, 1934	First Half, 1934	First Half 1935
Raw Materials:					
Lake ore consumption (gross tons)[a]	2,198,757	2,466,585	2,721,449	13,723,119	14,341,513
Coke production (net tons)[b]	.....	2,850,236	3,049,700	17,589,203	.....
Pig Iron:					
Pig iron output—monthly (gross tons)[c]	1,552,514	1,727,095	1,930,133	9,798,313	9,799,000
Pig iron output—daily (gross tons)[c]	54,138	55,713	64,388	54,134	54,138
Castings:					
Malleable castings—production (net tons)[d]	**27,548**	34,729	28,340	214,041	**231,897**
Malleable castings—orders (net tons)[d]	**25,668**	31,136	24,449	207,647	**220,228**
Steel castings—production (net tons)[d]	.....	30,646	50,286	249,484	.....
Steel castings—orders (net tons)[d]	.....	29,083	41,537	273,550	.....
Steel Ingots:					
Steel ingot production—monthly (gross tons)[e]	2,230,893	2,635,857	3,059,483	16,402,554	16,024,691
Steel ingot production—daily (gross tons)[e]	89,236	97,624	117,672	105,145	103,385
Steel ingot production—per cent of capacity[e]	40.31	44.10	53.44	47.75	46.70
Employment in Steel Industry:					
Total employees[e]	.....	**420,470**	**455,966**	**429,834**	.....
Total payrolls (thousands of dollars)[e]	.....	**46,494**	**49,467**	**258,401**	.....
Average hours worked per week[e]	.....	**33.9**	**36.2**	**34.1**	.....
Finished Steel:					
Trackwork shipments (net tons)[e]	4,210	4,228	6,184	28,647	21,575
Sheet steel sales (net tons)[f]	128,957	149,725	114,855	1,185,644	1,144,985
Sheet steel production (net tons)[f]	143,309	191,507	199,438	1,249,231	1,225,891
Fabricated shape orders (net tons)[g]	.....	**55,600**	**122,603**	**595,188**	.....
Fabricated shape shipments (net tons)[g]	.....	**79,336**	**104,041**	**462,071**	.....
Fabricated plate orders (net tons)[d]	.....	**17,630**	**27,395**	**138,833**	.....
Reinforcing bar awards (net tons)[e]	**14,985**	**12,080**	**21,315**	**110,885**	**112,755**
U. S. Steel Corpn. shipments (tons)[h]	578,108	598,915	985,337	3,678,895	3,553,999
Ohio River steel shipments (net tons)[i]	80,620	78,106	83,718	336,432	408,648
Fabricated Products:					
Automobile production, U. S. and Canada[k]	**377,065**	385,486	321,970	1,796,423	**2,373,471**
Construction contracts, 37 Eastern States[l]	$148,005,200	$126,718,600	$127,055,400	$854,101,900	$696,685,300
Steel barrel shipments (number)[d]	**501,730**	554,102	696,349	3,826,114	**3,032,964**
Steel furniture shipments (dollars)[d]	**$1,137,173**	$1,214,163	$1,045,539	$5,836,711	**$6,898,572**
Steel boiler orders (sq. ft.)[d]	**391,497**	640,824	359,749	1,916,040	**2,674,105**
Locomotive orders (number)[m]	3	2	3	83	16
Freight car orders (number)[m]	5,151	2	1,217	23,383	6,583
Machine tool index[n]	91.1	73.3	35.3	†42.6	†76.7
Foundry equipment index[o]	100.1	100.7	70.4	†68.3	†94.6
Foreign Trade:					
Total iron and steel imports (gross tons)[p]	**33,208**	47,719	24,858	167,638	**182,891**
Imports of pig iron (gross tons)[p]	**6,583**	23,174	5,168	65,386	**53,486**
Imports of all rolled steel (gross tons)[p]	.....	18,905	11,818	55,980	.....
Total iron and steel exports (gross tons)[p]	.....	286,599	219,406	1,253,174	.....
Exports of all rolled steel (gross tons)[p]	.....	65,255	71,965	494,767	.....
Exports of finished steel (gross tons)[p]	.....	60,487	61,425	429,547	.....
Exports of scrap (gross tons)[p]	.....	209,425	143,115	738,848	.....
British Production:					
British pig iron production (gross tons)[r]	529,300	558,900	514,900	2,898,400	3,172,000
British steel ingot production (gross tons)[r]	770,000	853,300	757,500	4,507,300	4,801,200
Non-Ferrous Metals:					
Lead production (net tons)[e]	33,002	37,358	33,218	213,697	192,116
Lead shipments (net tons)[e]	26,978	32,341	28,276	178,444	195,419
Zinc production (net tons)[t]	34,677	34,597	25,160	184,008	209,987
Zinc shipments (net tons)[t]	29,393	35,652	30,217	189,896	215,083
Deliveries of tin (gross tons)[v]	4,615	3,950	3,845	22,445	28,390

*Preliminary. †Three Months' Average.

Sources of figures: [a] Lake Superior Iron Ore Association; [b] Bureau of Mines; [c] THE IRON AGE; [d] Bureau of the Census; [e] American Iron and Steel Institute; [f] National Association of Flat-Rolled Steel Manufacturers; [g] American Institute of Steel Construction; [h] United States Steel Corpn.; [i] United States Engineer, Pittsburgh; [k] When preliminary, from Automobile Manufacturers Association—Final figures from Bureau of the Census; [l] F. W. Dodge Corpn.; [m] *Railway Age;* [n] National Machine Tool Builders Association; [o] Foundry Equipment Manufacturers Association; [p] Department of Commerce; [r] British Iron and Steel Federation; [s] American Bureau of Metal Statistics; [t] American Zinc Institute, Inc.; [v] New York Commodities Exchange.

Steel Production Advances Two and One-Half Points to 46 Per Cent

Expansion in Miscellaneous Demand on a Wide Front and Pronounced Strength of Scrap Raise Hopes for Continued Improvement in Operations

STEEL production has risen two and one-half points above last week's rate to 46 per cent of capacity, registering its fourth consecutive advance since Independence Day week and reaching the highest operating level since April. Hardly less impressive than the increase in output is the pronounced strength of scrap, which has been manifested by price advances in virtually all market centers. Increases of $1 a ton in steel scrap at Pittsburgh and Chicago and of 50c. at Philadelphia have raised THE IRON AGE scrap composite from $10.83 to $11.58 a ton, its highest level since the last week in February.

The rise of scrap prices was prompted both by improved fall prospects for steel business and by the impressive contra-seasonal gains in the operating rates in leading producing centers. Valley output has gone up four points to 50 per cent of capacity; the Cleveland-Lorain average is up eight points to 45 per cent; the Chicago rate has risen three points to 52 per cent; Pittsburgh production has forged ahead two points to 42 per cent. Elsewhere operations are substantially unchanged, with the Wheeling and Detroit districts maintaining the high rates of 75 and 95 per cent respectively.

THOUGH railroad steel has given mill operations added support of late, there has been little change in the relative contributions of leading sources of tonnage. Automotive demand, though on a reduced scale because of the season, is still at the head of the list owing to belated and unexpected requirements for old models. Tin plate production, though believed to be nearing a seasonal downturn, continues to hold at 88 per cent of mill capacity. Steel consumption by farm implement and tractor plants is unabated, and demand from makers of machine tools and other forms of machinery is expanding. But the really impressive feature of the market is the continued growth of business from unclassified sources, with unlooked for orders appearing on a wide front.

In view of the large part played by miscellaneous orders in boosting operations during July the steel trade looks for an even more pronounced upturn in August. At that time heavy buying for new model automobile production will mature and larger orders for construction will be placed, with other heavy tonnages to be awarded in the fall. Awards of construction steel to date this year, including fabricated structural steel work, plate work, sheet piling and concrete reinforcing, are still far behind those of a year ago, the comparative figures as compiled by THE IRON AGE being 614,634 tons for 1935 and 738,427 tons for 1934. But some unusually large projects are pending, including 72,470 to 104,640 tons of reinforcing bars on which the Los Angeles water district will take bids Aug. 19, and 20,000 tons of plates and 12,000 tons of structural steel for the Naval base at Pearl Harbor, Hawaii, on which tenders will be taken in September.

Private building is showing gradual but steady improvement, and expanding farmer buying, in step with excellent crop prospects, has been reflected in larger purchases of galvanized sheets and wire products. Bumper crops also are causing the railroads to resurvey their needs in rails and rolling stock. The Chesapeake & Ohio is expected to enter the market within a month or six weeks for 30,000 tons of rails.

WITH July orders for practically all finished steel products equal to or ahead of the June totals and with pig iron bookings well in advance of those of the previous month, the industry is beginning to entertain hopes for a last half that will equal or exceed the first six months of the year.

Increased confidence in the future, together with the growing strength of scrap, has stiffened the attitude of producers on prices. A leading automobile maker continues to dangle an inquiry for 100,000 tons of steel before the trade, primarily, it is believed, for the purpose of bringing out concessions, but every day that passes without the closing of the order is expected to work in favor of the industry's determination to avoid a serious break in its price structure. On the other hand, demands for revised extras, and particularly for quantity discounts, are being given serious consideration. A leading steel company has already announced a revision of extras on bars and small shapes to bring them "more nearly in line with manufacturing costs." A feature of the change is elimination of the extra for forging quality bars.

CONCERN over the PWA ruling that imported steel is to be bought for Government-financed projects if the foreign price is more than 15 per cent below the lowest American price appears to be premature. The action of the PWA conflicts with an order of the procurement division of the Treasury Department fixing a preference of 25 per cent in favor of domestic materials. Both rulings, however, appear to overstep the provisions of Section 2, of Title III, of the Treasury and Post Office Appropriation Act of 1934 which govern the placing of works relief projects. Finally, the pending Walsh bill, which is slated for passage, will require that all companies supplying materials for Government work observe wage and hour standards that prevailed under the code regime, a stipulation that would obviously bar foreign steel.

THE IRON AGE composite prices for finished steel and pig iron are unchanged at 2.124c. a lb. and $17.84 a ton respectively.

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous; Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron

Per Gross Ton:	July 30, 1935	July 23, 1935	July 2, 1935	July 31, 1934
No. 2 fdy., Philadelphia	$20.3132	$20.3132	$20.3132	$20.26
No. 2, Valley furnace	18.50	18.50	18.50	18.50
No. 2 Southern, Cin'ti	19.2007	19.2007	19.2007	19.13
No. 2, Birmingham†	14.50	14.50	14.50	14.50
No. 2 foundry, Chicago*	18.50	18.50	18.50	18.50
Basic, del'd eastern Pa.	19.8132	19.8132	19.8132	19.76
Basic, Valley furnace	18.00	18.00	18.00	18.00
Malleable, Chicago*	18.50	18.50	18.50	18.50
Malleable, Valley	18.50	18.50	18.50	18.50
L. S. charcoal, Chicago	24.2528	24.2528	24.2528	24.04
Ferromanganese, seab'd carlots	85.00	85.00	85.00	85.00

†This quotation is for delivery in South; in the North prices are 38c. a ton under delivery quotations from nearest Northern furnace.

*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Rails, Billets, etc.

Per Gross Ton:				
Rails, heavy, at mill	$36.37½	$36.37½	$36.37½	$36.37½
Light rails, Pittsburgh	35.00	35.00	35.00	35.00
Rerolling billets, Pittsburgh	27.00	27.00	27.00	27.00
Sheet bars, Pittsburgh	28.00	28.00	28.00	28.00
Slabs, Pittsburgh	27.00	27.00	27.00	27.00
Forging billets, Pittsburgh	32.00	32.00	32.00	32.00
Wire rods, Pittsburgh	38.00	38.00	38.00	38.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.70	1.70	1.70	1.70

Finished Steel

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	1.80	1.80	1.80	1.80
Bars, Chicago	1.85	1.85	1.85	1.85
Bars, Cleveland	1.85	1.85	1.85	1.85
Bars, New York	2.15	2.15	2.15	2.13
Plates, Pittsburgh	1.80	1.80	1.80	1.80
Plates, Chicago	1.85	1.85	1.85	1.85
Plates, New York	2.09	2.09	2.09	2.08
Structural shapes, Pittsburgh	1.80	1.80	1.80	1.80
Structural shapes, Chicago	1.85	1.85	1.85	1.85
Structural shapes, New York	2.06¼	2.06¼	2.06¼	2.05¼
Cold-finished bars, Pittsburgh	1.95	1.95	1.95	2.10
Hot-rolled strips, Pittsburgh	1.85	1.85	1.85	1.85
Cold-rolled strips, Pittsburgh	2.60	2.60	2.60	2.60

Finished Steel

Per Lb:	July 30, 1935 Cents	July 23, 1935 Cents	July 2, 1935 Cents	July 31, 1934 Cents
Hot-rolled annealed sheets, No. 24, Pittsburgh	2.40	2.40	2.40	2.40
Hot-rolled annealed sheets, No. 24, Gary	2.50	2.50	2.50	2.50
Sheets, galv., No. 24, P'gh	3.10	3.10	3.10	3.10
Sheets, galv., No. 24, Gary	3.20	3.20	3.20	3.20
Hot-rolled sheets, No. 10, P'gh	1.85	1.85	1.85	1.85
Hot-rolled sheets, No. 10, Gary	1.95	1.95	1.95	1.95
Wire nails, Pittsburgh	2.60	2.60	2.60	2.60
Wire nails, Chicago dist. mill	2.65	2.65	2.65	2.65
Plain wire, Pittsburgh	2.30	2.30	2.30	2.30
Plain wire, Chicago dist. mill	2.35	2.35	2.35	2.35
Barbed wire, galv., Pittsburgh	3.00	3.00	3.00	3.00
Barbed wire, galv., Chicago dist. mill	3.05	3.05	3.05	3.05
Tin plate, 100 lb. box, P'gh	$5.25	$5.25	$5.25	$5.25

Scrap

Per Gross Ton:				
Heavy melting steel, P'gh	$12.75	$11.75	$11.75	$11.75
Heavy melting steel, Phila.	10.75	10.50	10.50	10.00
Heavy melting steel, Ch'go	11.25	10.25	10.00	9.50
Carwheels, Chicago	11.75	10.75	10.50	9.50
Carwheels, Philadelphia	11.25	11.25	11.25	11.25
No. 1 cast, Pittsburgh	13.50	13.25	13.25	12.25
No. 1 cast, Philadelphia	11.25	11.25	11.25	11.75
No. 1 cast, Ch'go (net ton)	10.00	9.25	9.00	8.50
No. 1 RR. wrot., Phila.	10.25	10.25	10.25	11.25
No. 1 RR. wrot., Ch'go (net)	9.00	8.25	7.75	7.25

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	$3.25	$3.25	$3.35	$3.85
Foundry coke, prompt	3.40	4.00	4.00	4.60

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Electrolytic copper, refinery	7.75	7.75	7.75	8.75
Lake copper, New York	8.12½	8.12½	8.12½	9.12½
Tin (Straits), New York	52.70	52.45	51.87½	52.12½
Zinc, East St. Louis	4.40	4.30	4.30	4.30
Zinc, New York	4.77½	4.67½	4.67½	4.65
Lead, St. Louis	4.00	4.00	3.85	3.60
Lead, New York	4.15	4.15	4.00	3.75
Antimony (Asiatic), N. Y.	12.75	12.75	12.75	8.12½

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

The Iron Age Composite Prices

	Finished Steel	Pig Iron	Steel Scrap
July 30, 1935	2.124c. a Lb.	$17.84 a Gross Ton	$11.58 a Gross Ton
One week ago	2.124c.	17.84	10.83
One month ago	2.124c.	17.84	10.75
One year ago	2.124c.	17.90	10.42

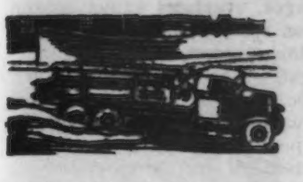
Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products make 85 per cent of the United States output.

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel High	Finished Steel Low	Pig Iron High	Pig Iron Low	Steel Scrap High	Steel Scrap Low
1935	2.124c., Jan. 3	2.124c., Jan. 8	$17.90, Jan. 8	$17.83, May 14	$12.33, Jan. 8	$10.33, April 23
1934	2.199c., April 24	2.008c., Jan. 2	17.90, May 1	16.90, Jan. 27	13.00, Mar. 13	9.50, Sept. 25
1933	2.015c., Oct. 3	1.867c., April 18	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3
1932	1.977c., Oct. 4	1.926c., Feb 2	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.43, July 5
1931	2.037c., Jan. 13	1.945c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.273c., Jan. 7	2.018c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.317c., April 2	2.273c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.286c., Dec. 11	2.217c., July 17	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 2
1927	2.402c., Jan. 4	2.212c., Nov. 1	19.71, Jan. 4	17.54, Nov. 1	15.25, Jan. 11	13.08, Nov. 22

Pittsburgh and Valley Operations in Further Rise



Local Rate Is Up Two Points to 42 Per Cent and Valley Average Rises Four Points to 50 Per Cent—Scrap Advances

PITTSBURGH, July 30.—Production of steel ingots in the Pittsburgh district this week is at about 42 per cent of capacity, up two points from last week, the rate being the highest for the district since that in the week ended Feb. 9. The Wheeling district is unchanged after last week's ten-point rise to 75 per cent, while the rate in the Valleys is up four points to 50 per cent, the highest rate since the last week in May.

Sentiment in Pittsburgh steel circles has undergone further improvement in the week, partly because tonnage has increased markedly at an unusual time and partly because mill customers take a more favorable view of the future. With automobile assemblies virtually unchanged for three weeks and demand from the motor industry fairly well sustained, the movement of steel in that direction is expected to continue longer than was first estimated but by the same token heavy production of new models may come later than was scheduled. Tin plate mills continue at their high operating rate of 88 per cent but are due for lighter running time soon. Stocks of tin plate at mills made to customers' specifications are not moving as rapidly as desired and apparently will not be exhausted before late September.

Mill prices have been holding firmly all along the line and it is now believed altogether probable that the possibility of the Ford Motor Co. placing some large orders will not disturb prices or terms.

In the secondary market for merchant wire products jobbers in various areas are cutting the prices they had under the code, which afforded them a fair margin of profit.

Pig Iron

Both the iron foundry and the steel foundry trades in this district are running at low rates, except for a good degree of activity at some of the works making steel mill machinery. Orders are confined almost wholly to single carload lots, but occasionally the tonnage of an order runs into three figures. A substantial part of the business goes to steel companies on a reciprocity basis. Prices ruling under the code have held rigidly. Consumers have not been seeking lower prices.

Semi-Finished Steel

Movement of sheet bars to tin plate mills this month has exceeded expectations, as these mills in general are running full. Sheet and strip mills have been taking a little more steel in the last fortnight than they did in June and the fore part of July. Somewhat more interest is being shown in forging billets on account of the approach of the new season in the automobile industry. Prices have held firmly.

Bolts, Nuts and Rivets

Demand for nuts and bolts is of fair proportions, with no material change in the past week. In number there has been a decrease in the last 30 days, due to the automobile industry's requirements being smaller, but as these requirements are in small sizes tonnage is not materially affected. Demand for rivets remains extremely poor. Prices of bolts and nuts are somewhat irregular, but no more so than formerly.

Rails and Track Accessories

The local rail mill is idle this week. It has been allocated 1200 tons of the Nickel Plate orders, which will total about 5000 tons. Releases for rolling have not yet been issued. Deliveries will be in August and September. Only small-sized orders are being placed for track accessories.

Reinforcing Steel

This month has run below June in demand, and June itself was a light month. The market is fairly steady, the chief weakness being in prices made by distributors.

Cold-Finished Bars

Tonnage has been well sustained this month at the June rate. Demand outside the automobile industry has grown slightly heavier of late. The automobile industry is buying only in small lots, for prompt shipment, as makers approach the end of runs on 1935 models. No tonnage of consequence has been placed against 1936 models, a few small lots being taken for experimental purposes.

Plates and Shapes

Steel plates for the 1500 Chesapeake & Ohio freight cars to be built at Butler, have been allocated to Pittsburgh district mills, but formal orders have not yet been supplied. Plates for the 2000 cars to be built at Huntington, W. Va., will come from elsewhere, the road thereby getting a haul. A good-sized assortment of tank work is in prospect, but little is being let at the moment. Fabricated structural steel lettings have run especially light in the past week. Structural mills maintain a fairly steady gait, as there is some large work in progress at the fabricating shops. Mills are holding prices strictly on plates and shapes.

Sheet Steel Piling

Business continues to run light, the 5000 tons reported a week ago as placed with Bethlehem Steel Co. for the Pickwick Dam, Tenn., being an exception.

Tubular Products

Demand for standard pipe has shown a slight upward trend in the last week or two, and July as a whole has been running slightly above June. While dwelling house construction is on a small scale, it shows a steady increase, which, in the course of time, should make for real activity. Commercial demand is of fair proportions, chiefly for repair work. In orders for steel boilers June was under May and also March, being above the other months of the first five. In heating surface the six months totaled 2,674,105 sq. ft. against 1,916,050 sq. ft. in the corresponding period of last year.

Volume of business in oil country goods shows a slight increase from May to June. For a long time the largest single outlet has been in connection with the redrilling of the east Texas field, which eventually will have about 25,000 wells, two-thirds of which are now completed. No important inquiries for line pipe are before the mills, but much laying of pipe lines is expected eventually, when financing becomes possible. Mills do not take very seriously the talk of laying a natural gas line to Detroit.

Bars

Demand for merchant steel bars has undergone a material increase,

chiefly from miscellaneous sources, and producers regard the fact that the increase is over a wide front as very favorable.

Wire Products

A sharp increase has occurred in the past week in demand for merchant wire products, and wire mills have increased their schedules as the buying is for immediate shipment. Jobbers in agricultural areas have taken hold freely, expecting a very good distribution season, as the farmers are relatively prosperous.

Sheets

Demand has increased in the week. One large interest had the heaviest bookings since the week ended Feb. 9. Galvanized sheets are doing particularly well, there being quite a fair demand already from farming sections while there is also demand in connection with general building. The increase in demand has brought sheet mill operations up to an average of fully 55 per cent, against a rate of 50 per cent a week ago.

Tin Plate

Mills continue to average an operation around 88 per cent, the majority running full. A decrease is expected soon, as specifications have run beyond seasonal expectations. Releases for shipment of tin plate previously made to customers' specifications have decreased.

Strip Steel

Demand for hot and cold-rolled strips shows no material change. Both classes of mills are running at between 30 and 35 per cent.

Coal and Coke

Both coal and coke consumers added to their stocks through last week, while this week, with the mining truce extended to Sept. 16, there is virtually no demand. Connellsville foundry coke has weakened and is now quoted at $3.40 to $3.65.

Scrap

With only a moderate amount of buying, heavy melting steel scrap has advanced $1 a ton and is strong at the new range of $12.50 to $13. Purchases at $13 have been made at two points in the district, while at another point in the district a mill has been picking up small lots and has paid no more than $12.50 and at still another point a dealer is paying $13. Nearly all other grades have advanced 25c. to $1, largely in sympathy with heavy melting. A small mill in the district has bought Pennsylvania Railroad heavy melting steel at $13.75. The general market of the Pittsburgh district is somewhat affected by the high bidding of dealers for delivery in the Wheeling and Youngstown districts, and dealers expect to secure $13.50 for heavy melting on the next important sales, although they may still sell small lots at $13. The low phosphorus railroad specialties, while in light demand, are scarce and are up 25c. to $14.50 to $15.

Steel Corporation Earnings Rise

EARNINGS and income of the United States Steel Corpn. for the second quarter of 1935 amounted to $14,117,864, after deducting ordinary repair and maintenance expenses and taxes. Earnings for the first quarter totaled $12,428,449. As in previous quarters, the board of directors voted a ½ per cent or 50c. dividend on preferred stock for the second period. This dividend is payable Aug. 30 to stockholders of record Aug. 2.

Shipments of finished steel for the second quarter amounted to 1,768,751 tons, as compared with shipments of 1,785,248 tons in the first quarter and shipments of 1,128,711 tons in the last quarter of 1934.

The second quarter of 1935 closed with a net deficit of $762,493, after allowances had been made for depletion, depreciation and obsolescence, interest on bonds and mortgages, overhead expenses and taxes on ore properties and transportation services. The deficit in the first quarter was $2,173,801. The 50c. stock dividend in the second quarter represents an additional payment of $1,801,405, which was provided for from undivided surplus. Thus the total deficit for the second quarter was $2,563,898. The total deficit for the first six months of 1935 amounted to $6,539,104.

"Closed Incident" Says Ickes of Steel Protest

HAROLD L. ICKES, Public Works Administrator, Tuesday at a press conference took the same position as that taken last Friday by President Roosevelt with regard to the purchase of foreign steel for use in PWA projects. Under a PWA order of May 25, it is required that foreign material be purchased for use in projects costing more than $10,000 if its price is 15 per cent less than the American price. Mr. Ickes, referring to the protest that domestic steel could not compete with foreign steel on this basis, said, "It is a closed incident so far as we are concerned." He said that no foreign steel has been purchased for PWA projects.

Ickes contended that the tariff on steel, together with the 15 per cent differential, was enough protection.

Despite officials' views, however, there is a growing doubt that any foreign steel will be purchased for projects financed either in part or wholly by Federal funds. Rather there is a belief that the effort made is to bring down prices of steel and other materials entering into construction jobs.

Weekly Indications of Steel Activity

From THE IRON AGE

	July 30, 1935	July 23, 1935	July 2, 1935	July 31, 1934	Average, Year to Date 1935	1934
Steel ingot operations—Per cent of capacity	46.0	43.5	32.0	26.0	45.2	45.3

	Week Ended July 30, 1935	July 23, 1935	July 2, 1935	July 31, 1934	Year to Date 1935	1934
Fabricated structural steel awards	4,250	11,100	7,000	11,150	393,702	490,020
Fabricated plate awards	3,800	2,485	2,475	1,515	71,867	85,467
Sheet steel piling awards	300	5,000	0	0	28,665	37,660
Reinforcing bar awards	1,525	800	4,400	2,950	120,400	125,280

Chicago Rate Up Three Points to 52 Per Cent

Business Confidence Rises and Scrap Advances on Broad Front—Quantity Extras on Finished Steel Under Discussion

CHICAGO, July 30.—The most striking feature about the local iron and steel market is the optimism which prevails among sellers and buyers. No one predicts a runaway market, but at the same time it is difficult to find the man who has not assured himself of a substantial fall business and there are those who venture the suggestion that the total business volume in the last half will exceed the total in the first half of the year.

Ingot output has advanced three points to 52 per cent of capacity, a rise which is contrary to usual performance at the close of July. Sales of finished steel, which include some of the Chesapeake & Ohio car material, have been exceeded by only one week so far this year and specifications for the week take fourth place in the seven months of 1935. Machinery builders of all kinds are busier and tractor plants continue to operate at full capacity.

There is a hint here and there of what the railroads are thinking about in the way of rails for 1936, as well as rolling stock. Automobile steel buying is making itself felt in a preliminary way, and miscellaneous demand is actually robust, with a strong tendency to expand from week to week.

Price structures remain intact so far as pig iron and finished steel are concerned. At the moment, the only real pressure is at the more or less vital point of quantity discounts.

The scrap market is buoyant and promises to remain so unless higher prices result in loosening supplies to the point where an overabundance is thrown at dealers and users.

Pig Iron

Shipments of Northern iron are well sustained and releases promise a rising demand during August. New buying is somewhat more active as melters become more and more convinced that prices are firmly established.

Coke

By-product foundry coke prices for August delivery are unchanged, though producers constantly point to higher costs and the fairness to them of higher quotations. Shipments are slowly expanding.

Reinforcing Bars

Dealers report that the market leans heavily on Mississippi River work for large tonnages, but that medium and small-sized projects are developing fast. The field of sewage disposal plants looks very promising at this time. Chicago Heights, McHenry and Des Plaines, all in Illinois, are taking bids, and many other small towns are having plans prepared. The State of Indiana has finally gotten into a good stride in the matter of road work. The plans by Illinois are still lagging, though it is estimated that about 137 overhead crossings will be constructed. Some in the trade believe that this program is being retarded in order to give employment in the winter months.

Cast Iron Pipe

Shipments continue to run below production, and most foundries are piling substantial tonnages of pipe against an expected upturn in demand in August. In the Chicago area a number of towns are planning sewage disposal plants. None of these is large, the range being from one to three carloads of pipe each. Inquiries are out now from Chicago Heights, McHenry, and Des Plaines, all in Illinois.

Plates

This market is back where it was several weeks ago when it was forced to depend upon odd tonnages for support. There is little news in the railroad equipment market beyond the fact that the Chesapeake & Ohio car tonnages have been placed and a fair part of the tonnage will move from Chicago mills to a point not far from Pittsburgh for the reason that the Chesapeake & Ohio can make use of its own line in the haul. The Santa Fe has an inquiry out for a light-weight coach. It is understood that a similar car is being built by one of the car builders and that the Santa Fe may build the second unit for purposes of cost of construction comparison. Oil-producing areas are quiet, but crane, dam and lock work promises some tonnage for mills.

Bars

Demand for miscellaneous bar mill products is steady and some new automobile business is again finding its way into the market. Forgers who make automobile parts are now taking steel, though it may be several weeks before they get under way in substantial volume. The matter of quotations on bars is again under discussion from two angles. One company has eliminated the extra for forging quality bars, and there is pressure, especially by automobile manufacturers, for quantity discounts. Tractor plants continue to produce at capacity and farm implement manufacturers are engaged beyond their expectations.

Rails

Although several tonnages have been officially added to makers' books, they are carryovers from awards that have been previously reported. The question now confronting mills is what will be the extent of the fall buying movement. A glimpse of the future is given by one railroad which usually is the first one in the market and which is about ready to make inquiry on a tonnage of about the same size as asked for a year ago. The light rail market is spotty and individual tonnages are small. Track accessory orders are in fair volume, all things considered, and they are being placed for prompt delivery.

Structural Material

Awards drop lower and lower as each week passes and there is nothing to revive them until some of the Mississippi River tonnages begin reaching shops. Even fresh inquiries are scattered and small. George A. Fuller is low on the general contract for the 11,000-ton addition to the Department of the Interior Building at Washington, D. C. Spencer, White & Prentice are low on the general contract for lock No. 3 at Red Wing, Minn.

Wire Products

July shipments are slightly under the June rate, but nevertheless they make a fine showing in comparison with the ordinary seventh month of the year. The trade feels that the outlook is excellent, and there are some sellers who go so far as to venture the suggestion that the second half may actually

exceed the first half in volume of business. In spite of much shouting by Government agencies, building is still quiet and wire mills are getting little help from that source. Several sizeable inquiries are out from automobile builders and others should soon make their appearance. The general agricultural outlook is considered better than it has been for several years past. Spring wheat is suffering from black and red rust in the Dakotas and in Minnesota.

Scrap

Mills have paid $11.50 a ton for heavy melting steel and dealers' trades have been made at $12 a ton, which indicates that the market is very strong at the new price levels. Other grades are moving up in sympathy with steel mill grades. Railroad offerings are light, but bidding for them is spirited, which is further indication of the speculative frame of mind which grips all dealers and brokers.

Boston Scrap Prices Are Stronger

BOSTON, July 30.—Following the lead of Pittsburgh, the market here for scrap delivered in that district is stronger, on the average 50c. to $1 a ton. Shipments to Pennsylvania are increasing. The American Steel & Wire Co., Worcester, Mass., has resumed buying of bundled skeleton at $6.50 a ton, delivered, and is reported to have made offers of around $8 a ton for No. 1 heavy melting steel. For Pennsylvania delivery, No. 1 steel, scrap rails, steel turnings, breakable cast, shafting and bundled skeleton lead in activity. The export scrap market continues rather quiet, but will be more active next month. A steamer at Portland, Me., loading 2000 tons of scrap rails, has been chartered to load 5000 tons additional rails here early in August for Italy, and negotiations are on for further exports. Local exports for the year to date are 93,854 tons, including 32,629 tons to Italy, 27,381 tons to the United Kingdom, 14,773 tons to Japan, 12,291 tons to Rumania, and 6780 tons to other countries.

The pig iron market is comparatively quiet, but with cooler weather foundry operations have increased, and indications are more raw material will be moving before the close of another month. Furnaces are holding prices firmly.

Small-lot buying of cast iron pipe has picked up, and, with a few round tonnages closed, the market is more active than it has been in some time. Prices are holding well.

Scrap Advances At Cincinnati

CINCINNATI, July 30.—Persistent agitation for higher scrap prices has moved dealers to advance bids 50c. to $1 on all items. While this apparent strengthening of the market is without selling test, it does represent the trade's willingness to pay more for material and follows speculative activity in which dealers steadily bid up the prices against each other. On the other hand, mills are not interested in purchasing in view of present inventories, but, with these estimated to last 30 to 60 days, dealers feel that concerted effort at this time will build up prices against the ultimate demand in the early fall. Old contracts are being cleaned out and a few isolated spot sales are reported, but no important consumer interest has appeared.

The district sheet steel market is holding to higher than seasonal levels, with demand averaging about 55 per cent of capacity. Galvanized sheets continue to be in remarkably heavy demand, operations of galvanizing units reaching about 80 per cent of capacity. Efforts on the part of one large consumer of sheets to break price schedules the past week failed, strengthening the general market undertone.

The week's bookings of pig iron receded slightly from the previous period, but remained above seasonal levels. Spot shipments for immediate use averaged about 700 tons, of which 250 tons was Southern iron. Contract specifications are steady and no rejections of size are reported. Foundry operations have risen to about 50 to 55 per cent of capacity. The improvement is largely the result of a sharp increase in demand for machine tool castings. Difficulty in obtaining a sufficient supply of skilled labor, however, is handicapping melters.

Foundry activity is also reflected in the steady shipments of industrial coke, current averages being above seasonal levels.

Scrap Prices Up At St. Louis

ST. LOUIS, July 30.—Strength in other scrap markets has caused the market here to respond accordingly, and dealers have shoved up their buying prices on a number of items. Offerings are very light, stocks in dealers' yards are light, and they are inclined to hold what they have for higher prices. Selected heavy and No. 1 melting steel, miscellaneous standard section rails, No. 2 railroad wrought, and rails for rolling are 25c. a ton higher, and steel rails less than 3 ft. and steel angle bars are 50c. a ton up.

Shipments of pig iron during July have been holding up well, and are said to be more than seasonal. Buying continues on a hand-to-mouth basis, although better than might be expected for this time of year. Although the optimism felt by melters in the territory has not been reflected in buying of pig iron, a marked pick-up is expected in August and September, especially in view of the firmness in the price situation.

Warehouse business for July, it is estimated, will run about 20 per cent ahead of the same month a year ago. The buying has been general.

Bids will be opened today for a nurses' home for the Homer G. Phillips City Hospital for Colored, requiring 220 tons of reinforcing bars. The Missouri Highway Commission will readvertise for bids for a bridge across the Meramec River in St. Louis, requiring 700 tons of structural steel.

Malleable Castings Output Off in June

WASHINGTON, July 30.—Production of malleable castings in June totaled 27,548 net tons and for the six months ended June amounted to 231,897 tons. The May output was 34,729 tons. Shipments in June were 31,905 tons and for the six months were 237,375 tons. May shipments were 37,573 tons. Orders booked in June were 25,668 tons and for the first six months of 1935 totaled 220,228 tons. Orders booked in May were 31,136 tons. In the first six months of last year production was 214,041 tons, shipments were 210,501 tons and orders booked were 207,647 tons.

Railroad Equipment

Norfolk Southern has ordered 500 all-steel box cars from Pullman-Standard Car Mfg. Co. It is expected that they will be built in carbuilder's Richmond, Va., plant.

Argentine State Railways are in the market for 1000 box cars.

Delaware, Lackawanna & Western is inquiring for 1000 wheels representing its third quarter requirements.

Cerro de Pasco Copper Co., Peru, South America, is inquiring for 20 ore hopper cars.

United Fruit Co. is inquiring for one locomotive of 2-8-2 type for export to Cuba.

Atchison, Topeka & Santa Fe is inquiring for one light-weight chair car.

Worcester Street Railway Co. has ordered 12 coaches from American Car & Foundry Motors Co., subsidiary of American Car & Foundry Co.

Prices of Finished Steel and Iron Products

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel	*Base per Lb.*
F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
F.o.b. Gary	1.85c.
F.o.b. Duluth	1.95c.
Del'd Detroit	1.95c.
F.o.b. Cleveland	1.85c.
F.o.b. Buffalo	1.90c.
Del'd Philadelphia	2.11c.
Del'd New York	2.15c.
F.o.b. Birmingham	1.95c.
F.o.b. cars dock Gulf ports	2.20c.
F.o.b. cars Pacific ports	2.35c.

Rail Steel

(For merchant trade)

F.o.b. Pittsburgh	1.70c.
F.o.b. Chicago	1.75c.
F.o.b. Gary	1.75c.
F.o.b. Moline, Ill.	1.75c.
F.o.b. Cleveland	1.75c.
F.o.b. Buffalo	1.80c.
F.o.b. Birmingham	1.85c.
F.o.b. cars dock Gulf ports	2.10c.
F.o.b. cars dock Pacific ports	2.25c.

Billet Steel Reinforcing

(Straight lengths as quoted by distributers)

F.o.b. Pittsburgh	2.05c.
F.o.b. Chicago	2.10c.
F.o.b. Gary	2.10c.
Del'd Detroit	2.20c.
F.o.b. Cleveland	2.10c.
F.o.b. Youngstown	2.10c.
F.o.b. Buffalo	2.10c.
F.o.b. Birmingham	2.10c.
F.o.b. cars dock Gulf ports	2.45c.
F.o.b. cars dock Pacific ports	2.45c.

Rail Steel Reinforcing

(Straight lengths as quoted by distributers)

F.o.b. Pittsburgh	1.90c.
F.o.b. Chicago	1.95c.
F.o.b. Gary	1.95c.
F.o.b. Cleveland	1.95c.
F.o.b. Youngstown	1.95c.
F.o.b. Buffalo	1.95c.
F.o.b. Birmingham	1.95c.
F.o.b. cars dock Gulf ports	2.30c.
F.o.b. cars dock Pacific ports	2.30c.

Iron

F.o.b. Chicago	1.80c.
F.o.b. Terre Haute, Ind.	1.75c.
F.o.b. Louisville, Ky.	2.10c.
F.o.b. Danville, Pa.	1.80c.
F.o.b. Berwick, Pa.	1.70c.

Cold Finished Bars and Shafting*

	Base per Lb.
F.o.b. Pittsburgh	1.95c.
F.o.b. Chicago	2.00c.
F.o.b. Gary	2.00c.
F.o.b. Cleveland	2.00c.
F.o.b. Buffalo	2.05c.
Del'd Detroit	2.15c.
Del'd eastern Michigan	2.20c.

* In quantities of 10,000 to 19,000 lb.

Fence and Sign Posts

Angle Line Posts	*Base per Net Ton*
F.o.b. Pittsburgh	$50.00
F.o.b. Chicago	50.00
F.o.b. Duluth	51.00
F.o.b. Cleveland	50.00
F.o.b. Birmingham	53.00
F.o.b. Houston, Orange, Beaumont, Galveston	59.00
F.o.b. Mobile	58.00
F.o.b. New Orleans, Lake Charles, Corpus Christi	59.00
F.o.b. cars dock Pacific ports	63.00

Plates

	Base per Lb.
F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
F.o.b. Gary	1.85c.
Del'd Cleveland	1.995c.
F.o.b. Coatesville	1.90c.
F.o.b. Sparrows Point	1.90c.
Del'd Philadelphia	1.99c.
Del'd New York	2.09c.
F.o.b. Birmingham	1.95c.
F.o.b. cars dock Gulf ports	2.20c.
F.o.b. cars dock Pacific ports	2.35c.
Wrought iron plates, f.o.b. P'gh	3.20c.

Floor Plates

F.o.b. Pittsburgh	3.35c.
F.o.b. Chicago	3.40c.
F.o.b. Coatesville	3.45c.
F.o.b. cars dock Gulf ports	3.75c.
F.o.b. cars dock Pacific ports	3.90c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
Del'd Cleveland	1.995c.
F.o.b. Buffalo	1.90c.
F.o.b. Bethlehem	1.90c.
Del'd Philadelphia	2.015c.
Del'd New York	2.0625c.
F.o.b. Birmingham (standard)	1.95c.
F.o.b. cars dock Gulf ports	2.20c.
F.o.b. cars dock Pacific ports	2.35c

Steel Sheet Piling

	Base per Lb.
F.o.b. Pittsburgh	2.15c.
F.o.b. Chicago	2.25c.
F.o.b. Buffalo	2.25c.
F.o.b. cars dock Gulf ports	2.60c.
F.o.b. cars dock Pacific ports	2.60c.

SHEETS, STRIP, TIN PLATE TERNE PLATE

Sheets

Hot Rolled

	Base per Lb.
No. 10, f.o.b. Pittsburgh	1.85c.
No. 10, f.o.b. Gary	1.95c.
No. 10, del'd Detroit	2.05c.
No. 10, del'd Phila.	2.16c.
No. 10, f.o.b. Birmingham	2.00c.
No. 10, f.o.b. cars dock Pacific ports	2.40c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	2.40c.
No. 24, f.o.b. Gary	2.50c.
No. 24, del'd Detroit	2.60c.
No. 24, del'd Phila.	2.71c.
No. 24, f.o.b. Birmingham	2.55c.
No. 24, f.o.b. cars dock Pacific ports	3.05c.
No. 24, wrought iron, Pittsburgh	4.30c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh	2.50c.
No. 10 gage, f.o.b. Gary	2.60c.
No. 10 gage, del'd Detroit	2.70c.
No. 10 gage, del'd Phila	2.81c.
No. 10 gage, f.o.b. Birmingham	2.65c.
No. 10 gage, f.o.b. cars dock Pacific ports	3.10c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh	2.95c.
No. 20 gage, f.o.b. Gary	3.05c.
No. 20 gage, del'd Detroit	3.15c.
No. 20 gage, del'd Phila.	3.26c.
No. 20 gage, f.o.b. Birmingham	3.10c.
No. 20, f.o.b. cars dock Pacific ports	3.50c.

Galvanized Sheets

No. 24 gage, f.o.b. Pittsburgh	3.10c.
No. 24, f.o.b. Gary	3.20c.
No. 24, del'd Phila.	3.41c.
No. 24, f.o.b. Birmingham	3.25c.
No. 24, f.o.b. cars dock Pacific ports	3.70c.
No. 24, wrought iron, Pittsburgh	4.95c.

Long Ternes

No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh	3.40c.
F.o.b. Gary	3.50c.
F.o.b. cars dock Pacific ports	4.10c.

Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh	3.10c.
No. 20, f.o.b. Gary	3.20c.
No. 20, f.o.b. Birmingham	3.10c.
No. 20, f.o.b. cars dock Pacific ports	3.70c.
No. 10, f.o.b. Pittsburgh	2.50c.
No. 10, f.o.b. Gary	2.60c.
No. 10, f.o.b. Birmingham	2.10c.
No. 10, f.o.b. cars dock Pacific ports	3.10c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.75c.
No. 28, Gary	2.85c.
No. 28, cars dock Pacific Coast ports	3.35c.

Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mill	$5.25
Standard cokes, f.o.b. Gary	5.35
Standard cokes, f.o.b. cars dock Pacific ports	5.90

Terne Plate

(F.o.b. Pittsburgh)

(Per Package, 20 x 28 in.)

8-lb. coating I.C.	$10.00
15-lb. coating I.C.	12.00
20-lb. coating I.C.	13.00
25-lb. coating I.C.	14.00
30-lb. coating I.C.	15.25
40-lb. coating I.C.	17.50

Hot-Rolled Hoops, Bands, Strips and Flats under ¼ In.

	Base per Lb.
All widths up to 24 in., P'gh	1.85c.
All widths up to 24 in., Chicago	1.95c.
All widths up to 24 in., del'd Detroit	2.05c.
All widths up to 24 in., Birmingham	2.00c.
Cooperage stock, Pittsburgh	1.95c.
Cooperage stock, Chicago	2.05c.

Cold-Rolled Strips

	Base per Lb.
F.o.b. Pittsburgh	2.60c.
F.o.b. Cleveland	2.60c.
Del'd Chicago	2.895c.
F.o.b. Worcester	2.80c.

Fender Stock

No. 14, Pittsburgh or Cleveland	2.90c.
No. 14, Worcester	3.30c.
No. 20, Pittsburgh or Cleveland	3.30c.
No. 20, Worcester	3.70c.

Hot-Rolled Rail Steel Strips

	Base per Lb.
F.o.b. Pittsburgh	1.70c.
F.o.b. Chicago	1.75c.
F.o.b. Birmingham	1.85c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

To Manufacturing Trade	*Per Lb.*
Bright wire	2.30c.
Spring wire	2.90c.

Chicago prices on products sold to the manufacturing trade are $1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are $2 a ton above, Birmingham $3 above, and Pacific Coast prices $9 a ton above Pittsburgh or Cleveland.

To Jobbing Trade

Qualified jobbers are entitled to a reduction of 20c. a 100 lb. from the base price on carload shipments to stock, and of 10c. a 100 lb. on less-carload shipments to stock.

	Base per Keg
Standard wire nails	$2.60
Smooth coated nails	2.60
Galvanized nails:	
15 gage and coarser	4.60
16 gage and finer	5.10

	Base per 100 Lb.
Annealed fence wire	$2.45
Galvanized fence wire	2.80
Polished staples	3.30
Galvanized staples	3.55
Barbed wire, galvanized	3.00
Woven wire fence, base column	63.00

Chicago and Anderson, Ind., mill prices are $1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is $2 above Pittsburgh): Duluth, Minn., and Worcester, Mass., mill prices are $2 a ton over Pittsburgh (except for woven wire fence at Duluth, which is $3 over Pittsburgh), and Birmingham mill prices are $3 a ton over Pittsburgh.

On wire nails, barbed wire, staples and fence wire, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are $6 a ton over Pittsburgh, while Pacific Coast prices are $8 over Pittsburgh. Exception: on fence wire Pacific Coast prices are $11 a ton above Pittsburgh.

On staples and barbed wire, prices of $6 a ton above Pittsburgh are also quoted at Beaumont and Orange, Tex.

Wire Hoops, Twisted or Welded

	Off List
F.o.b. Pittsburgh	35 and 2½ off
F.o.b. Chicago	35 off

STEEL AND WROUGHT PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

Steel			Wrought Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛	51½	29½	⅛	+91½	+138
¼ to ⅜	53½	35	¼ & ⅜	+1½	+21½
½	58½	47	½	31½	15
¾	62	52	¾	36½	20½
1 to 3	64	55	1 & 1¼	39½	25½
			1½	43½	28
			2	41½	26

Lap Weld

2	60	51	2	37	22½
2½ to 3	63	54	2½ to 3½	38	25
3½ to 6	65	56	4 to 8	40	28½
7 and 8	64	54	9 to 12	38	24½
9 and 10	63½	53½			
11 and 12	62½	52½			

Butt Weld, extra strong, plain ends

⅛	48½	33½	⅛	+12	+45½
¼ to ⅜	51	38	¼ & ⅜	+2½	+34½
½	56½	47½	½	32½	17½
¾	61	52	¾	37½	22½
1 to 3	63	55	1 to 2	43½	29

Lap Weld, extra strong, plain ends

2	58	50	2	40	26
2½ to 3	62	54	2½ to 4	45½	32
3½ to 6	65½	57½	4½ to 6	45	33½
7 and 8	64½	54½	7 & 8	46	33
9 and 10	63½	53½	9 to 12	41½	30
11 and 12	62½	52½			

On standard steel pipe an extra 5% off is allowed on sales to consumers while two 5's off apply on sales to jobbers. On less-than-carload shipments prices are determined by adding 20 and 25% and the carload freight rate to the base card. On structural steel pipe the base card is reduced 2 points and two 5's off are allowed to consumers and three 5's off to jobbers.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh, in carload lots)

		Cold Drawn	Hot Rolled
1 in. o.d.	13 B.W.G.	$ 8.60	$ 7.52
1¼ in. o.d.	13 B.W.G.	10.19	9.26
1½ in. o.d.	13 B.W.G.	11.26	10.23
1¾ in. o.d.	13 B.W.G.	12.81	11.64
2 in. o.d.	13 B.W.G.	14.35	13.04
2¼ in. o.d.	13 B.W.G.	16.00	14.54
2½ in. o.d.	12 B.W.G.	17.61	16.01
2¾ in. o.d.	12 B.W.G.	19.29	17.54
3 in. o.d.	12 B.W.G.	20.45	18.59
3½ in. o.d.	11 B.W.G.	21.45	19.50
4 in. o.d.	10 B.W.G.	41.08	37.35
4½ in. o.d.	10 B.W.G.	37.09	34.62
5 in. o.d.	9 B.W.G.	51.56	46.87
6 in. o.d.	7 B.W.G.	79.15	71.96

Extras for less-carload quantities:

25,000 lb. or ft. to 39,999 lb. or ft.	5 %
12,000 lb. or ft. to 24,999 lb. or ft.	12½ %
6,000 lb. or ft. to 11,999 lb. or ft.	25 %
2,000 lb. or ft. to 5,999 lb. or ft.	35 %
Under 2,000 lb. or ft.	50 %

Lapweld Steel and Knobbled Charcoal Iron Pressure Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh, in carload lots)

		Steel	Iron
1½ in. o.d.	13 B.W.G.	$ 9.73	$20.16
1¾ in. o.d.	13 B.W.G.	11.06	21.84
2 in. o.d.	13 B.W.G.	12.38	17.23
2¼ in. o.d.	13 B.W.G.	13.79	19.58
2½ in. o.d.	12 B.W.G.	16.58	24.19
2¾ in. o.d.	12 B.W.G.	17.54	26.46
3 in. o.d.	12 B.W.G.	18.35	28.39
3½ in. o.d.	11 B.W.G.	21.56	33.95
3½ in. o.d.	11 B.W.G.	23.15	36.16
4 in. o.d.	10 B.W.G.	28.66	45.26
4½ in. o.d.	10 B.W.G.	35.22	50.48
5 in. o.d.	9 B.W.G.	44.25	61.86
6 in. o.d.	7 B.W.G.	68.14	102.46

Quantity Extras:

40,000 lb. or ft.	base
25,000 lb. or ft. to 39,999 lb. or ft.	plus 5%
10,000 lb. or ft. to 24,999 lb. or ft.	plus 12½ %
2,000 lb. or ft. to 9,999 lb. or ft.	plus 25%
Under 2,000 lb. or ft.	plus 40%

CAST IRON WATER PIPE

	Per Net Ton
*6-in. and larger, del'd Chicago	$48.40
*4-in., del'd Chicago	51.40
6-in. and larger, del'd New York	45.20
4-in., del'd New York	48.20
*6-in. and larger, Birmingham	40.00
*4-in. Birmingham	43.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles	48.00
F.o.b. dock, Seattle	48.50
4-in., f.o.b. dock, San Francisco or Los Angeles	51.00
F.o.b. dock, Seattle	51.50

Class "A" and gas pipe, $3 extra.

*Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is $39, Birmingham, and $47.40, delivered Chicago, and 4-in. pipe, $42, Birmingham, and $50.40 a ton, delivered Chicago.

RAILROAD MATERIALS

Rails and Track Supplies

F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton	$36.37½
Angle bars, per 100 lb.	2.55

F.o.b. Code Basing Points

Light rails (from billets) per gross ton	$35.00
Light rails (from rail steel) per gross ton	34.00

	Base per 100 Lb.
Spikes, 9/16 in. and larger	$2.40
Spikes, ½ in. and smaller	2.40
Tie plates, steel	1.90
Tie plates, Pacific Coast ports	2.00
Track bolts, to steam railroads	3.55
Track bolts, to jobbers, all sizes (per 100 count)	70 per cent off list

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Buffalo, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minneapolis, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa.; on spikes alone, Cleveland, Youngstown, Lebanon, Pa., Columbia, Pa., Richmond, Va.

BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
Machine bolts	70, 10 and 5
Carriage bolts	70, 10 and 5
Lag bolts	70, 10 and 5
Plow bolts, Nos. 1, 2, 3 and 7 heads	70, 10 and 5
Hot-pressed nuts, blank or tapped, square	70, 10 and 5
Hot-pressed nuts, blank or tapped, hexagons	70, 10 and 5
C.p.c. and t. square or hex. nuts, blank or tapped	70, 10 and 5
Semi-finished hexagon nuts, U.S.S. and S.A.E., all sizes to and incl. 1 in. diameter	70, 10 and 5
Larger than 1 in. diameter	70
Stove bolts in packages, Pittsburgh	75
Stove bolts in packages, Chicago	75
Stove bolts in packages, Cleveland	75
Stove bolts in bulk, Pittsburgh	83
Stove bolts in bulk, Chicago	83
Stove bolts in bulk, Cleveland	83
Tire bolts	60 and 5

Large Rivets

(½-in. and larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$2.90
F.o.b. Chicago	3.00
F.o.b. Birmingham	3.05

Small Rivets

(7/16-in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70 and 5
F.o.b. Cleveland	70 and 5
F.o.b. Chicago and Birm'g'm	70 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws, 1 in. dia. and smaller	85 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller	75 and 10
Milled headless set screws, cut thread ¾ in. and smaller	75
Upset hex. head cap screws, U.S.S.S. or S.A.E. thread, 1 in. dia. and smaller	87½
Upset set screw, cut and oval point	80
Milled studs	65 to 65 and 10

Alloy and Stainless Steel

Alloy Steel Ingots

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Uncropped .....$40 per gross ton

Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Base price, $49 a gross ton.

Alloy Steel Bars

Price del'd Detroit is $52.

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.
Open-hearth grade, base .....2.45c.
Delivered price at Detroit is .....2.60c.

S.A.E. Series Numbers	Alloy Differential per 100 lb.
2000 (½ Nickel)	$0.25
2100 (2½% Nickel)	0.55
2300 (3½% Nickel)	1.50
2500 (5% Nickel)	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum) (1.50 to 2.00 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Spring Steel	base
6100 Chromium Vanadium Bar	1.20
6100 Chromium Vanadium Spring Steel	0.70
Chromium Nickel Vanadium	1.50
Carbon Vanadium	0.95

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. The differential for cold-drawn bars ½c. per lb. higher with separate extras. Blooms, billets and slabs under 4x4 in. or equivalent are sold on the bar base. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base. Sections 4x4 in. to 10x10 in. or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes carry extras.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo. 2.95c. base per lb.

STAINLESS STEEL No. 302

(17 to 19% Cr. 7 to 9% NI. 0.08 to 0.20% C.)
(Base Prices f.o.b. Pittsburgh)

	Per Lb.
Forging billets	19.55c.
Rerolling slabs	15c.
Bars	23c.
Plates	26c.
Structural shapes	23.
Sheets	33c.
Hot-rolled strip	20½c.
Cold-rolled strip	27c.
Drawn wire	23c.

Raw and Semi-Finished Steel

Carbon Steel Rerolling Ingots

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham.
Uncropped .....$29 per gross ton

Carbon Steel Forging Ingots

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Birmingham.
Uncropped .....$31 per gross ton

Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham.

	Per Gross Ton
Rerolling	$27.00
Forging quality	32.00

Delivered Detroit

Rerolling	$30.00
Forging	35.00

Billets Only F.o.b. Duluth

Rerolling	$29.00
Forging	34.00

Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

	Per Gross Ton
Open-hearth or Bessemer	$28.00

Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

	Per Lb.
Grooved	1.70c.
Universal	1.70c.
Sheared	1.70c.

Tube Rounds

	Base per Lb.
F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
F.o.b. Cleveland	1.85c.
F.o.b. Buffalo	1.90c.
F.o.b. Birmingham	1.95c.

Wire Rods

(Common, base)

	Per Gross Ton
F.o.b. Pittsburgh	$38.00
F.o.b. Cleveland	38.00
F.o.b. Chicago	39.00
F.o.b. Anderson, Ind.	39.00
F.o.b. Youngstown	39.00
F.o.b. Worcester, Mass.	40.00
F.o.b. Birmingham	41.00
F.o.b. San Francisco	47.00
F.o.b. Galveston	44.00

Pig Iron and Ferroalloys

PIG IRON

PRICES PER GROSS TON AT BASING POINTS

Basing Points	No. 2 Fdry.	Malleable	Basic	Bessemer
Everett, Mass.	$19.50	$20.00	$19.00	$20.50
Bethlehem, Pa.	19.50	20.00	19.00	20.50
Birdsboro, Pa.	19.50	20.00	19.00	20.50
Swedeland, Pa.	19.50	20.00	19.00	20.50
Steelton, Pa.	....	....	19.00	....
Sparrows Point, Md.	19.50	....	19.00	....
Neville Island, Pa.	18.50	18.50	18.00	19.00
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Youngstown	18.50	18.50	18.00	19.00
Buffalo	18.50	19.00	17.50	19.50
Erie, Pa.	18.50	19.00	18.00	19.50
Cleveland	18.50	18.50	18.00	19.00
Toledo, Ohio	18.50	18.50	18.00	19.00
Jackson, Ohio	20.25	20.25	19.75	20.75
Detroit	18.50	18.50	18.00	19.00
Hamilton, Ohio	18.50	18.50	18.00	19.00
Chicago	18.50	18.50	18.00	19.00
Granite City, Ill.	18.50	18.50	18.00	....
Duluth, Minn.	19.00	19.00	....	19.50
Birmingham	14.50	14.50	13.50	19.00
Provo, Utah	17.50	....	17.00	....

DELIVERED PRICES PER GROSS TON AT CONSUMING CENTERS

	No. 2 Fdry.	Malleable	Basic	Bessemer
Boston Switching District From Everett, Mass.	$20.00	$20.50	$19.50	$21.00
Brooklyn From East. Pa.	21.9289	22.4289	21.9289	22.9289
Newark or Jersey City, N. J. From East. Pa.	20.9873	21.4873	20.4873	21.9873
Philadelphia From Eastern Pa.	20.3132	20.8132	19.8132	21.3132
Cincinnati From Hamilton, Ohio	19.5807	19.5807	19.0807	20.0807
Canton, Ohio From Cleveland and Youngstown	19.8402	19.8402	19.3402	20.3402
Columbus, Ohio From Hamilton, Ohio	20.64	20.64	....	....
Mansfield, Ohio From Cleveland and Toledo	20.3832	20.3832	....	....
Indianapolis From Hamilton, Ohio	20.9289	20.9289	....	....
South Bend, Ind. From Chicago	20.6935	20.6935	....	....
Milwaukee From Chicago	19.57	19.57	....	....
St. Paul From Duluth	20.94	....	....	....
Davenport, Iowa From Chicago	20.3832	20.3832	....	....
Kansas City From Granite City	21.2178	21.2178	....	....
San Francisco, Los Angeles or Seattle. From Provo	22.315	....	....	....

Delivered prices on Southern iron for shipment to Northern points are 38c. a gross ton below delivered prices from the nearest Northern basing points.

LOW PHOSPHORUS PIG IRON

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y. $23.50

GRAY FORGE PIG IRON

Valley furnace	$18.00
Pittsburgh district furnace	18.00

CHARCOAL PIG IRON

Lake Superior furnace	$21.00
Delivered Chicago	24.2528
Delivered Buffalo	24.595

CANADA

Pig Iron

Per gross ton:

Delivered Toronto

No. 1 fdy., sil. 2.25 to 2.75	$21.00
No. 2 fdy., sil. 1.75 to 2.75	20.50
Malleable	21.00

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75	$22.50
No. 2 fdy., sil. 1.75 to 2.25	22.00
Malleable	22.50
Basic	22.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

	Per Gross Ton
Domestic, 80% (carload)	$85.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$26.00
50-ton lots 3-mo. shipment	24.00
F.o.b. New Orleans	26.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50% (carloads)	$77.50
50% (ton lots)	85.00
75% (carloads)	126.00
75% (ton lots)	136.00

Silvery Iron

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*	
6%	$22.75	12%	$29.25
7%	23.75	13%	30.75
8%	24.75	14%	32.25
9%	25.75	15%	33.75
10%	26.75	16%	35.25
11%	27.75	17%	36.75

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Manganese 2 to 3%, $1 a ton additional. For each unit of manganese over 3%, $1 a ton additional.

Bessemer Ferrosilicon

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*	
10%	$27.75	14%	$33.25
11%	28.75	15%	34.75
12%	30.25	16%	36.25
13%	31.75	17%	37.75

Manganese 2 to 3%, $1 a ton additional. For each unit of manganese over 3%, $1 a ton additional. Phosphorus 0.75% or over, $1 ton additional.

Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Other Ferroalloys

Ferrotungsten, per lb. contained W. del., carloads	$1.35 to $1.45
Ferrotungsten, less carloads	1.45 to 1.55
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr. per lb. contained Cr. delivered, in carloads	10.00c.
Ferrochromium, 2% carbon	16.50c. to 17.00c.
Ferrochromium, 1% carbon	17.50c. to 18.00c.
Ferrochromium, 0.10% carbon	19.50c. to 20.00c.
Ferrochromium, 0.06% carbon	20.00c. to 20.50c.
Ferrovanadium, del. per lb. contained V.	$2.70 to $2.90
Ferrocarbontitanium, 15 to 18% Ti, 6 to 8% C. f.o.b. furnace carload and contract per net ton	$137.50
Ferrophosphorus, electric, or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton with $2 unitage	50.00
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per gross ton with $2.75 unitage	65.00
Ferromolybdenum, per lb. Mo., del.	95c.
Calcium molybdate, per lb. Mo., del.	80c
Silico spiegel, per ton, f.o.b. furnace, car lots	$38 00
Ton lots or less per ton	45.50
Silico-manganese, gross ton, delivered: 2.50% carbon grade	90.00
2% carbon grade	95.00
1% carbon grade	105.00
Spot prices	$5 a ton higher

Iron and Steel Scrap

PITTSBURGH

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$12.50 to $13.00
No. 2 heavy melting steel	11.00 to 11.50
No. 2 railroad wrought	12.00 to 12.50
Scrap rails	13.50 to 14.00
Rails, 3 ft. and under	14.50 to 15.00
Compressed sheet steel	12.50 to 13.00
Hand bundled sheet steel	11.00 to 11.50
Hvy. steel axle turnings	10.00 to 10.50
Machine shop turnings	8.50 to 9.00
Short shov. turnings	8.50 to 9.00
SLort mixed borings and turnings	6.50 to 7.00
Cast iron borings	6.50 to 7.00
Cast iron carwheels	12.25 to 12.75
Heavy breakable cast	11.50 to 12.00
No. 1 cast	13.00 to 14.00
Railr. knuckles and couplers	14.50 to 15.00
Rail coil and leaf springs	14.50 to 15.00
Rolled steel wheels	14.50 to 15.00
Low phos. billet crops	15.00 to 15.50
Low phos. sheet bar crops	14.25 to 14.75
Low phos. punchings	14.50 to 15.00
Low phos, plate scrap	14.00 to 14.50
Steel car axles	14.25 to 14.75

CHICAGO

Delivered Chicago district consumers:

	Per Gross Ton
Heavy melting steel	$11.00 to $11.50
Automobile hvy. melt. steel	10.50 to 11.00
Shoveling steel	11.00 to 11.50
Hydraulic comp. sheets	10.00 to 10.50
Drop forge flashings	8.75 to 9.25
No. 1 busheling	10.00 to 10.50
Rolled carwheels	12.00 to 12.50
Railroad tires	13.00 to 13.50
Railroad leaf springs	12.00 to 12.50
Axle turnings	10.25 to 10.75
Steel couplers and knuckles	12.00 to 12.50
Coil springs	13.50 to 14.00
Axle turnings (elec. fur.)	10.75 to 11.25
Low phos. punchings	14.00 to 14.50
Low phos. plates, 12 in. and under	14.00 to 14.50
Cast iron borings	6.00 to 6.50
Short shoveling turnings	6.00 to 6.50
Machine shop turnings	6.25 to 6.75
Rerolling rails	12.00 to 12.50
Steel rails, less than 3 ft.	12.50 to 13.00
Steel rails, less than 2 ft.	14.00 to 14.50
Angle bars, steel	13.00 to 13.50
Cast iron carwheels	11.75 to 12.25
Railroad malleable	13.25 to 13.75
Agricultural malleable	9.75 to 10.25

	Per Net Ton
Iron car axles	$15.50 to $16.00
Steel car axles	14.00 to 14.50
No. 1 railroad wrought	9.00 to 9.50
No. 2 railroad wrought	9.50 to 10.00
No. 2 busheling	6.00 to 6.50
Locomotive tires, smooth	11.00 to 11.50
Pipe and flues	6.00 to 6.50
No. 1 machinecy cast	10.00 to 10.50
Clean automobile cast	9.50 to 10.00
No. 1 railroad cast	9.00 to 9.50
No. 1 agricultural cast	9.00 to 9.50
Stove plate	7.50 to 8.00
Grate bars	7.50 to 8.00
Brake shoes	7.50 to 8.00

PHILADELPHIA

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$10.50 to $11.00
No. 2 heavy melting steel	9.50 to 10.00
Hydraulic compressed, new	10.00 to 10.50
Hydraulic compressed, old	8.00 to 8.50
Steel rails for rolling	12.50 to 13.50
Cast iron carwheels	11.00 to 11.50
Heavy breakable cast	10.50 to 11.00
No. 1 cast	11.00 to 11.50
Stove plate (steel works)	8.50
Machine shop turnings	6.00 to 6.50
No. 1 blast furnace	5.00
Heavy axle turnings	9.50 to 10.00
Cast borings	5.00 to 5.50
No. 1 low phos. heavy	13.75 to 14.25
Couplers and knuckles	13.50 to 14.00
Rolled steel wheels	13.50 to 14.00
Steel axles	16.00
Shafting	17.50
No. 1 railroad wrought	10.00 to 10.50
Spec. iron and steel pipe	9.50 to 10.00
Bundled sheets	9.50 to 10.00
No. 1 forge fire	9.50 to 10.00
Cast borings (chem.)	10.50 to 13.00

CINCINNATI

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	$8.50 to $9.00
No. 2 heavy melting steel	7.00 to 7.50
Scrap rails for melting	8.25 to 8.75
Loose sheet clippings	5.00 to 5.50
Bundled sheets	6.25 to 6.75
Cast iron borings	4.50 to 5.00
Machine shop turnings	4.75 to 5.25
No. 1 busheling	6.25 to 6.75
No. 2 busheling	2.75 to 3.25
Rails for rolling	9.25 to 9.75
No. 1 locomotive tires	7.50 to 8.00
Short rails	12.00 to 12.50
Cast iron carwheels	8.50 to 9.00
No. 1 machinery cast	9.50 to 10.00
No. 1 railroad cast	8.75 to 9.25
Burnt cast	6.25 to 6.75
Stove plate	6.25 to 6.75
Agricultural malleable	8.25 to 8.75
Railroad malleable	9.50 to 10.00

CLEVELAND

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$10.50 to $11.00
No. 2 heavy melting steel	10.00 to 10.50
Compressed sheet steel	10.00 to 10.50
Light bundled sheet stampings	8.00 to 8.50
Drop forge flashings	8.50 to 9.00
Machine shop turnings	6.50 to 7.00
Short shoveling turnings	7.00 to 7.50
No. 1 busheling	9.00 to 9.50
Steel axle turnings	9.00 to 9.50
Low phos. billet crops	14.00 to 14.50
Cast iron borings	7.00 to 7.50
Mixed borings and short turnings	7.00 to 7.50
No. 2 busheling	7.00 to 7.50
No. 1 cast	12.50 to 13.00
Railroad grate bars	7.00 to 7.50
Stove plate	7.50 to 8.00
Rails under 3 ft.	13.00 to 13.50
Rails for rolling	15.50 to 16.00
Railroad malleable	13.50 to 14.00
Cast iron carwheels	10.75 to 11.00

BUFFALO

Per gross ton, f.o.b. Buffalo consumers' plants:

No. 1 heavy melting steel	$10.75 to $11.25
No. 2 heavy melting scrap	9.75 to 10.25
Scrap rails	11.00
New hydraul. comp. sheets	9.75 to 10.25
Old hydraul. comp. sheets	8.75 to 9.25
Drop forge flashings	9.75 to 10.25
No. 1 busheling	9.75 to 10.25
Hvy. steel axle turnings	8.00 to 8.50
Machine shop turnings	4.50 to 5.00
Knuckles and couplers	11.50 to 12.00
Coil and leaf springs	11.50 to 12.00
Rolled steel wheels	11.50 to 12.00
Low phos. billet crops	12.00 to 12.50
Short shov. steel turnings	6.50 to 7.00
Short mixed borings and turnings	6.50 to 7.00
Cast iron borings	6.50 to 7.00
No. 2 busheling	6.50
Steel car axles	11.50 to 12.00
Iron axles	11.50 to 12.00
No. 1 machinery cast	11.50 to 12.50
No. 1 cupola cast	10.50 to 11.00
Stove plate	9.00 to 9.50
Steel rails, 3 ft. and under	12.50 to 13.00
Cast iron carwheels	11.00 to 11.50
Industrial malleable	12.00 to 13.00
Railroad malleable	12.00 to 13.00
Chemical borings	8.00 to 8.50

BOSTON

Dealers' buying prices per gross ton:

*No. 1 heavy melting steel	$8.50
No. 1 heavy melting steel	$6.40 to 6.90
*Scrap T rails	8.50
Scrap rails	6.40 to 6.90
*No. 2 steel	7.25 to 7.50
No. 2 steel	5.40 to 5.90
Breakable cast	5.50 to 5.75
Machine shop turnings	2.50
*Machine shop turnings (short)	4.00 to 4.25
Bundled skeleton, long	5.25 to 5.50
Forge flashings	5.25 to 5.50
Shafting	12.25 to 12.50
Steel car axles	12.00 to 12.25
Cast iron borings, chemical	7.00
*Stove plate	6.25 to 6.50

Per gross ton delivered consumers' yards:

Textile cast	$9.00 to $9.50
No. 1 machinery cast	9.00 to 9.50
Stove plate	6.00 to 6.50
Railroad malleable	11.00 to 11.50

* Delivered local army base.

NEW YORK

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	*$7.00 to †$8.50
No. 2 heavy melting steel	*5.50 to ††7.50
Heavy breakable cast	6.00 to 6.50
No. 1 machinery cast	7.00 to 7.50
No. 2 cast	†6.50
Stove plate	††6.25
Steel car axles	13.50 to 14.00
Shafting	12.75 to 13.00
No. 1 railroad wrought	7.00 to 7.50
No. 1 yard wrought, long	6.00 to 6.50
Spec. iron and steel pipe	4.50 to 5.00
Forge fire	5.50 to 6.00
Rails for rolling	8.50 to 9.00
Short shoveling turnings	3.00 to 3.25
Machine shop turnings	3.00 to 3.25
Cast borings	3.50 to 3.75
No. 1 blast furnace	2.00 to 2.50
Cast borings (chemical)	11.00 to 11.50
Unprepared yard iron and steel	4.00 to 4.50

Per gross ton, delivered local foundries:

No. 1 machinery cast	$10.00
No. 1 hvy. cast (cupola size)	9.00
No. 2 cast	7.50

* For direct car loading only.
† Loading on barge.

BIRMINGHAM

Per gross ton delivered consumers' yards:

Heavy melting steel	$9.00 to $9.50
Scrap steel rails	10.00 to 10.50
Short shoveling turnings	7.00
Stove plates	7.00
Steel axles	11.50
Iron axles	11.50
No. 1 railroad wrought	7.00
Rails for rolling	12.50
No. 1 cast	9.50 to 10.00
Tramcar wheels	10.00

ST. LOUIS

Per gross ton delivered consumers' yards:

Selected heavy steel	$9.25 to $9.75
No. 1 heavy melting	8.50 to 9.00
No. 2 heavy melting	7.50 to 8.00
No. 1 locomotive tires	9.75 to 10.25
Misc. stand-sec. rails	10.25 to 10.75
Railroad springs	11.25 to 11.75
Bundled sheets	6.00 to 6.50
No. 2 railroad wrought	8.50 to 9.00
No. 1 busheling	5.00 to 5.50
Cast iron borings and shoveling turnings	3.00 to 3.50
Rails for rolling	10.75 to 11.25
Machine shop turnings	2.75 to 3.25
Heavy turnings	5.50 to 6.00
Steel car axles	12.50 to 13.00
Iron car axles	15.00 to 16.00
No. 1 railroad wrought	6.50 to 7.00
Steel rails less than 3 ft.	12.00 to 12.50
Steel angle bars	10.00 to 10.50
Cast iron carwheels	8.00 to 8.50
No. 1 machinery cast	8.50 to 9.00
Railroad malleable	10.50 to 11.00
No. 1 railroad cast	8.00 to 8.50
Stove plate	6.50 to 7.00
Agricult. malleable	8.50 to 9.00

DETROIT

Dealers' buying prices per gross ton:

Heavy melting steel	$8.50 to $9.00
Borings and short turnings	5.00 to 5.50
Long turnings	$4.50 to $5.00
No. 1 machinery cast	11.00 to 11.50
Automotive cast	11.25 to 11.75
Hydraul. comp. sheets	9.00 to 9.50
Stove plate	6.75 to 7.25
New factory busheling	8.00 to 8.50
Old No. 2 busheling	4.50 to 5.00
Sheet clippings	5.75 to 6.25
Flashings	7.75 to 8.25
Low phos. plate scrap	9.50 to 10.00

CANADA

Dealers' buying prices per gross ton:

	Toronto	Montreal
Heavy melting steel	$7.00	$7.00
Rails scrap	8.00	8.00
Machine shop turnings	3.00	3.00
Boiler plate	4.50	4.50
Heavy axle turnings	4.50	4.00
Cast borings	4.00	3.50
Steel borings	2.00	2.00
Wrought pipe	3.50	3.50
Steel axles	7.00	8.00
Axles, wrought iron	7.00	8.00
No. 1 machinery cast	9.00	9.00
Stove plate	5.50	5.00
Standard carwheels	7.25	7.00
Malleable	6.75	7.00

ORES, FLUORSPAR, COKE, FUEL, REFRACTORIES

Lake Superior Ores

Delivered Lower Lake Ports

	Per Gross Ton
Old range, Bessemer, 51.50% iron	$4.80
Old range, non-Bessemer, 51.50% iron	4.65
Mesabi, Bessemer, 51.50% iron	4.65
Mesabi, non-Bessemer, 51.50% iron	.50
High phosphorus, 51.50% iron	4.40

Foreign Ore

C.i.f. Philadelphia or Baltimore

	Per Unit
Iron, low phos., copper free, 55 to 58% iron, dry Spanish or Algeria	10.50c.
Iron, low phos., Swedish, average 68½% iron	10.50c.
Iron, basic or foundry, Swedish, aver. 65% iron	9.50c.
Iron, basic or foundry, Russian, aver. 65% iron	9.50c.
Manganese, Caucasian, washed 52%	26c.
Manganese, African, Indian, 44-48%	22c.
Manganese, African, Indian, 49-51%	24c.
Manganese, Brazilian, 46 to 48½%	20c.

	Per Net Ton Unit
Tungsten, Chinese, wolframite, duty paid, delivered	$16.00 to $16.50
Tungsten, domestic, scheelite, delivered	16.50

	Per Gross Ton
Chrome, 45% Cr_2O_3, lump, c.i.f. Atlantic Seaboard (African)	$17.50
45 to 46% Cr_2O_3 (Turkish)	$16.00 to 16.50
48% Cr_2O_3 (African)	20.50
48% min. Cr_2O_3 (Turkish)	19.25
Chrome concentrate, 50% and over Cr_2O_3, c.i.f. Atlantic Seaboard	22.00
52% Cr_2O_3 (Turkish)	21.75
48 to 49% Cr_2O_3 (Turkish)	19.25

Fluorspar

	Per Net Ton
Domestic, washed gravel, 85-5, f.o.b. Kentucky and Illinois mines for all-rail shipment	$14.00 to $15.00
Same grade for Ohio River barge shipment for Kentucky and Illinois River landings	14.00 to 15.00
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	14.00 to 15.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	18.50
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	30.00

COKE, COAL AND FUEL OIL

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville Prompt	$3.25 to $3.50
Foundry, f.o.b. Connellsville Prompt	3.40 to 3.65
Foundry, by-product, Chicago ovens, for delivery outside switching district	8.50
Foundry, by-product, delivered in Chicago switching district	9.25
Foundry, by-product, New England, delivered	11.00
Foundry, by-product, Newark or Jersey City, del'd	9.24 to 9.72
Foundry, by-product, Phila.	9.03
Foundry, by-product, Cleveland, delivered	9.25
Foundry, Birmingham	6.00
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry, by-product, del'd St. Louis	9.00
Foundry, from Birmingham, f.o.b. cars docks, Pacific ports	14.75

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.45 to $1.65
Mine run coking coal, f.o.b. W. Pa.	1.75 to 1.95
Gas coal, ¾-in., f.o.b. Pa. mines	1.90 to 2.35
Mine run gas coal, f.o.b. Pa. mines	1.75 to 1.95
Steam slack, f.o.b. W. Pa. mines	1.00 to 1.25
Gas slack, f.o.b. W. Pa. mines	1.20 to 1.45

Fuel Oil

	Per Gal. f.o.b. Bayonne, N. J.
No. 3 distillate	4.25c.
No. 4 industrial	3.87½c.

	Per Gal. f.o.b. Baltimore
No. 3 distillate	4.25c.
No. 4 industrial	3.87½c.

	Per Gal. del'd Chicago
No. 3 industrial fuel oil	4.75c.
No. 5 industrial fuel oil	3.75c.

	Per Gal. f.o.b. Cleveland
No. 3 distillate	5.25c.
No. 4 industrial	5.12½c.
No. 5 industrial	4.25c.

REFRACTORIES

Fire Clay Brick

	Per 1000 f.o.b. Works High-heat Duty Brick	Intermediate Duty Brick
Pennsylvania	$45.00	$40.00
Maryland	5.00	40.00
New Jersey	50.00	43.00
Ohio	45.00	40.00
Kentucky	45.00	40.00
Missouri	45.00	40.00
Illinois	45.00	40.00
Ground fire clay, per ton	7.00	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$45.00
Chicago District	54.00
Birmingham	55.00
Silica clay, per net ton	8.00

Chrome Brick

	Per Net Ton
Standard, f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	$45.00
Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	45.00

Magnesite Brick

	Per Net Ton
Standard, f.o.b. Baltimore and Chester, Pa.	$65.00
Chemically Bonded, f.o.b. Baltimore	55.00

Grain Magnesite

	Per Net Ton
Imported f.o.b. Baltimore and Chester, Pa.	$45.00
Domestic, f.o.b. Baltimore and Chester	40.00
Domestic, f.o.b. Chewelah, Wash.	22.00

Warehouse Prices for Steel Products

PITTSBURGH

Base per Lb.

Plates	3.15c.
Structural shapes	3.15c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.90c.
Cold-finished and screw stock:	
Rounds and hexagons	3.20c.
Squares and flats	3.20c.
Hoops and bands under ¼ in.	3.20c.
Hot-rolled annealed sheets (No. 24), 25 or more bundles	3.30c.
Galv. sheets (No. 24), 25 or more bundles	3.95c.
Hot-rolled sheets (No. 10)	2.95c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	$3.69
Spikes, large	2.90c.
Track bolts, all sizes, per 100 count,	65 per cent off list.
Machine bolts, 100 count,	65 per cent off list.
Carriage bolts, 100 count,	65 per cent off list.
Nuts, all styles, 100 count,	65 per cent off list.
Large rivets, base per 100 lb.	$3.50
Wire, black, soft ann'l'd, base per 100 lb.	*2.70
Wire, galv, soft, base per 100 lb.	*2.925
Common wire nails, per keg	*2.834
Cement coated nails, per keg	*2.834

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 9999 lbs.

*Delivered in Pittsburgh switching district.

CHICAGO

Base per Lb.

Plates and structural shapes	3.20c.
Soft steel bars	2.95c.
Cold-fin. steel bars:	
Rounds and hexagons	3.35c.
Flats and squares	3.35c.
Hot-rolled strip	3.30c.
Hot-rolled annealed sheets (No. 24)	3.85c.
Galv. sheets (No. 24)	4.55c.
Hot rolled sheets (No. 10)	3.05c.
Spikes (keg lots)	3.50c.
Track bolts (keg lots)	4.65c.
Rivets, structural (keg lots)	3.65c.
Rivets, boiler (keg lots)	3.75c.

Per Cent Off List

Machine bolts	*70
Carriage bolts	*70
Lag screws	*70
Hot-pressed nuts, sq. tap. or	
Hot-pressed nuts, sq. tap or blank	*70
Hot-pressed nuts, hxe. tap or	
Hot-pressed nuts, hex. tap or blank	*70
Hex. head cap screws	87½
Cut point set screws	80
Flat head bright wood screws	50 and 20
Spring cotters	55
Stove bolts in full packages	70
Rd. hd. tank rivets, 7/16 in. and smaller	57½
Wrought washers	$4.50 off list
Black ann'l'd wire per 100 lb.	$2.85
Com. wire nails, base per keg	2.95†
Cement c't'd nails, base per keg	2.95†

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. All prices are f.o.b. consumers' plants within the Chicago switching district.

*These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 65 per cent off. Discounts applying to country trade are 70 per cent off, f.o.b., Chicago, with full or partial freight allowed up to 50c. per 100 lb.

†Prices for city and suburbs only.

NEW YORK

Base per Lb.

Plates, ¼ in. and heavier	3.40c.
Structural shapes	3.37c.
Soft steel bars, small shapes	3.26c.
Iron bars	3.26c.
Iron bars, swed. charcoal	6.50c.
Cold-fin. shafting and screw stock:	
Rounds and hexagons	3.81c.
Flats and squares	4.31c.
Cold rolled: strip, soft and quarter hard	3.36c.
Hoops	3.56c.
Bands	3.56c.
Hot-rolled sheet (No. 10)	3.31c.
Hot-rolled ann'l'd sheets (No. 24*)	3.89c.
Galvanized sheets (No. 24*)	4.50c.
Long terne sheets (No. 24)	5.20c.
Standard tool steel	11.00c.
Wire, black annealed (No. 10)	3.40c.
Wire, galv. (No. 10)	3.75c.
Tire steel, 1 x ½ in. and larger	3.65c.
Open hearth spring steel	4.00c. to 10.00c.
Common wire nails, base, per keg	$3.21

	Per Cent Off List
Machine bolts, cut thread:	
All diameters	65 and 10
Carriage bolts, cut thread:	
All diameters	65 and 10

	Per 100 Ft.
Boiler tubes:	
Lap welded, 2-in.	$18.05
Seamless welded, 2-in.	19.24
Charcoal iron, 2-in.	24.94
Charcoal iron 4-in.	63.65

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

ST. LOUIS

Base per Lb.

Plates and struc. shapes	3.45c.
Bars, soft steel or iron	3.20c.
Cold-fin. rounds, shafting, screw stocks	3.60c.
Hot-rolled annealed sheets (No. 24)	4.10c.
Galv. sheets (No. 24)	4.65c.
Hot-rolled sheets (No. 10)	3.30c.
Black corrug. sheets (No. 24)	4.10c.
*Galv. corrug. sheets	4.65c.
Structural rivets	4.00c.
Boiler rivets	4.10c.

Per Cent Off List

Tank rivets, 7/16 in. and smaller	55
Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts:	
All quantities	70

*No. 26 and lighter take special prices.

PHILADELPHIA

Base per Lb.

*Plates, ¼-in. and heavier	2.98c.
*Structural shapes	2.98c.
*Soft steel bars, small shapes, iron bars (except bands)	2.93c.
‡Reinforec. steel bars, sq. twisted and deformed	2.96c.
Cold-finished steel bars	3.61c.
*Steel hoops	3.43c.
*Steel bands, No. 12 and 3/16 in. incl.	3.18c.
Spring steel	5.00c.
†Hot-rolled anneal. sheets (No. 24)	3.65c.
†Galvanized sheets (No. 24)	4.30c.
*Hot-rolled annealed sheets (No. 10)	3.08c.
Diam. pat. floor plates, ¼ in.	4.95c.
Swedish iron bars	6.25c.

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.

*Base prices subject to deduction on orders aggregating 4000 lb. or over.

†For 50 bundles or over.

‡For less than 2000 lb.

CLEVELAND

Base per Lb.

Plates and struc. shapes	3.31c.
Soft steel bars	2.95c.
Reinforc. steel bars	2.10c.
Cold-finished steel bars	3.25c.
Flat-rolled steel under ¼ in.	3.36c.
Cold-finished strip	†3.00c.
Hot-rolled annealed sheets (No. 24)	3.96c.
Galvanized sheets (No. 24)	4.61c.
Hot-rolled sheets (No. 10)	3.11c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets	3.56c.
Black ann'l'd wire, per 100 lb.	$2.65
No. 9 galv. wire, per 100 lb.	3.00
Com. wire nails, base per keg	2.40

†Outside delivery 10c. less.

CINCINNATI

Base per Lb.

Plates and struc. shapes	3.42c.
Bars, soft steel or iron	3.17c.
New billet reinforc. bars	3.25c.
Rail steel reinforc. bars	3.25c.
Hoops and bands, 3/16 in. and lighter	3.47c.
Cold-finished bars	3.57c.
Hot-rolled annealed sheets (No. 24)	4.02c.
Galv. sheets (No. 24)	4.72c.
Hot-rolled sheets (No. 10)	3.22c.
Structural rivets	4.35c.
Small rivets	55 per cent off list
No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over)	$2.88
Com. wire nails, base per keg:	
Any quantity less than carload	3.04
Cement c't'd nails, base 100-lb. keg	3.50
Chain, 1-in. per 100 lb.	3.35

	Net per 100 Ft.
Seamless steel boiler tubes, 2-in.	$22.66
4-in.	48.14
Lap-welded steel boiler tubes, 2-in.	19.35
4-in.	45.30

BUFFALO

Base per Lb.

Plates	3.38c.
Struc. shapes	3.25c.
Soft. steel bars	3.00c.
Reinforcing bars	2.60c.
Cold-fin. flats and sq.	3.40c.
Round and hex.	3.40c.
Cold-rolled strip steel	3.19c.
Hot-rolled annealed sheets (No. 24)	4.06c.
Heavy hot-rolled sheets, 3/16 in., 24 to 48 in. wide	3.63c.
Galv. sheets (No. 24)	4.70c.
Bands	3.43c.
Hoops	3.43c.
Heavy hot-rolled sheets	3.18c.
Com. wire nails, base per keg	$3.35
Black wire, base per 100 lb. (2500-lb. lots or under)	3.55
(Over 2500 lb.)	3.45

BOSTON

Base per Lb.

Beams, channels, angles, tees, zees	3.54c.
H beams and shapes	3.51c.
Plates—sheered, tank and univ. mill, ¼ in. thick and heavier	3.56c.
Floor plates, diamond pattern	5.36c.
Bar and bar shapes (mild steel)	3.35c.
Bands 3/16 in. thick and No. 12 ga. incl.	3.65c. to 4.65c.
Half rounds, half ovals, ovals and bevels	4.60c.
Tire steel	4.60c.
Cold-rolled strip steel	3.245c.
Cold-finished rounds, squares and hexagons	3.90c.
Cold-finished flats	3.75c.
Blue annealed sheets, No. 10 ga.	3.65c.
One pass cold-rolled sheets No. 24 ga.	4.20c.
Galvanized steel sheets, No. 24 ga.	4.90c.
Lead coated sheets, No. 24 ga.	5.85c.

Prices delivered by truck in metropolitan Boston, subject to quantity differentials.

DETROIT

Base per Lb.

Soft and bars	3.04c.
Structural shapes	3.42c.
Plates	3.42c.
Floor plates	5.17c.
Hot-rolled annealed sheets (No. 24)	3.94c.
Hot-rolled sheets (No. 10)	3.14c.
Galvanized sheets (No. 24)	4.72c.
Bands	3.39c.
Hoops	3.39c.
Cold-finished bars	3.49c.
Cold-rolled strip	3.18c.
Hot-rolled alloy steel (S.A.E. 3100 Series)	5.29c.*
Bolts and nuts	70 and 5 per cent off list

Prices delivered by truck in metropolitan Detroit, subject to quantity differentials.

*Price applies to 1,000 lb. and over.

MILWAUKEE

Base per Lb.

Plates and structural shapes	3.31c.
Soft steel bars	3.06c.
Hot-rolled strip	3.41c.
Hot-rolled sheets (No. 10)	3.16c.
Hot-rolled annealed sheets (No. 24)	3.96c.
Galvanized sheets (No. 24)	4.66c.
Cold-finished steel bars	3.61c.
Cold-rolled strip	3.30c.
Structural rivets (keg lots)	3.86c.
Boiler rivets (keg lots)	3.96c.
Track spikes (keg lots)	3.71c.
Track bolts (keg lots)	4.86c.
Black annealed wire	3.10c.
Com. wire nails	2.90c.
Cement coated nails	2.90c.

	Per Cent Off List
Machine bolts	70
Carriage bolts	70
Hot-pressed nuts, sq. and hex., tapped or blank (keg lots)	70

Prices given above are delivered Milwaukee.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 3499 lb. On cold-finished bars the prices are for orders of 300 to 499 lb.

ST. PAUL

Base per Lb.

Mild steel bars	3.20c.
Structural shapes	3.45c.
Plates	3.45c.
Cold-finished bars	3.87c.
Bands and hoops	3.55c.
Hot-rolled annealed sheets, No. 24	3.90c.
Galvanized sheets, No. 24	4.50c.
Cold-rolled sheets, No. 20	4.95c.

On mild steel bars, shapes, plates and hoops and bands the base applies on 400 to 14,999 lb. On cold-finished bars, hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over.

BALTIMORE

Base per Lb.

*Mild steel bars	2.95c.
*Iron bars	2.95c.
*Reinforcing bars	2.95c.
*Structural shapes	3.00c.
†Plates	3.00c.
†Hot-rolled sheet, No. 10	3.10c.
Hot-rolled annealed sheets, No. 24	3.60c.
Galvanized sheets, No. 24	4.30c.
*Bands	3.20c.
*Hoops	3.45c.
Cold-rolled rounds	3.58c.
Cold-rolled squares, hex. and flats	3.58c.
Rivets	4.40c.
Bolts and nuts, per cent off list	60 and 10

*Quantity extras per size apply. †Quantity extras per thickness apply. Hot-rolled quantity extras are: 2000 lb. and over, base: 1500 lb. to 1999 lb., add 15c. per 100 lb.; 1000 lb. to 1499 lb., add 30c.; 0 to 999 lb., add 50c.

CHATTANOOGA

Base per Lb.

Mild steel bars	3.31c.
Iron bars	3.31c.
Reinforcing bars	3.31c.
Structural shapes	3.56c.
Plates	3.56c.
Hot-rolled sheets, No. 10	3.36c.
Hot-rolled annealed sheets, No. 24	4.21c.
Galvanized sheets, No. 24	4.86c.
Steel bands	3.61c.
Cold-finished bars	3.98c.

MEMPHIS

Base per Lb.

Mild steel bars	3.41c.
Shapes, bar size	3.41c.
Iron bars	3.41c.
Structural shapes	3.66c.
Plates	3.66c.
Hot-rolled sheets, No. 10	3.46c.
Hot-rolled annealed sheets, No. 24	4.26c.
Galvanized sheets, No. 24	4.96c.
Steel bands	3.71c.
Cold-drawn rounds	3.85c.
Cold-drawn flats, squares, hexagons	6.45c.
Structural rivets	4.25c
Bolts and nuts, per cent off list	65
Small rivets, per cent off list	50

PACIFIC COAST

Base per Lb.

	San Francisco	Los Angeles	Seattle
Plates, tank and U. M.	3.55c.	3.60c.	3.55c.
Shapes, standard	3.55c.	3.60c.	3.55c.
Soft steel bars	3.60c.	3.60c.	3.60c.
Reinforcing bars, f.o.b cars dock Pacific ports	2.45c.	2.45c.	2.45c.
Hot-rolled annealed sheets (No. 24)	4.40c.	4.35c.	4.40c.
Hot-rolled sheets (No. 10)	3.75c.	3.70c.	3.75c.
Galv. sheets (No. 24)	5.00c.	4.95c.	5.00c.
Cold finished steel:			
Rounds	5.95c.	5.85c.	6.00c.
Squares and hexagons	7.20c.	7.10c.	7.25c.
Flats	7.70c.	7.60c.	8.25c.
Common wire nails—base per keg less carload	$3.30	$3.40	$3.30

All items subject to differentials for quantity.

TOOL STEEL

Prices are same for warehouse distribution at all points on or East of Mississippi River. West of Mississippi quotations are 1c. a lb. higher.

Base per Lb.

High speed	57c.
High carbon chrome	37c.
Oil hardening	22c.
Extra	17c.
Regular	14c.

Producers Sell 17,400 Tons of Prime Western During Week; Price Steady

July Bookings of Copper Will Probably Exceed 72,000 Tons—Lead Quiet With Prices Very Firm—Tin Continues Scarce

NEW YORK, July 30.—Electrolytic copper continues in moderate demand each day, and the statistical position of the metal is steadily improving as producers are holding production in check. Total July sales now amount to over 70,000 tons, and indications are that over 72,000 tons will be booked by the end of the month. All producers continue to adhere to the 8c. a lb., Connecticut Valley price structure, and there is no tonnage of "second hand" metal available below this figure. A change from the present 8c. price basis is unlikely at the present time, although a heavy consumer demand in September and October would probably force the price upward. Foreign sellers have expressed disappointment that the American quotation has not advanced, inasmuch as the world price is thus held down to a lower level. A little more business has developed abroad, but the market is still far from active. The price this morning was steady at 7.70c., c.i.f. usual Continental base ports.

Zinc

Consumers of spelter entered orders for about 17,400 tons of Prime Western during the week, with delivery dates specified from August up to the end of the year. Undelivered sales now stand at 37,100 tons, an increase of 13,300 tons over the position of a week ago. Even though galvanizers are now busier than usual for this time of the year, the heavy forward sales on producers' books indicate that buying will probably contract somewhat over the next month. The extensive coverage also will tend to discourage an advance in price from the present 4.40c. a lb., East St. Louis, level. Despite predictions that the Joplin ore market would rise in sympathy with refined metal, concentrates continue to be quoted in that area at $27 and $28 a ton for flotation and mill grades respectively. Offerings at these levels are, however, none too plentiful as sales during the week amounted to only 4000 tons despite a production of 7700 tons.

Lead

Battery makers came into the market yesterday for moderately heavy bookings. Today's market, however, has quieted considerably, and only occasional carlots for August-September delivery are moving. It is estimated that August requirements of users are now about 85 per cent covered, but September has hardly been touched. It is this potential September demand which gives support to the present market, and if orders for this position become urgent there is every possibility that prices may stage a rise. The market continues quotable at 4.15c. a lb., New York, the contract settling basis of the American Smelting & Refining Co., and 4c. a lb. at St. Louis. St. Joseph lead is still disposing of its own brands in the East at a five-point premium, but is willing to meet the 4c. level in the West.

Tin

Very little business developed during the week. The most interesting market feature has been the movement of 1200 tons of buffer stock from New York to London by the International Tin Committee. This action was taken on pressure from the Colonial Home Office to relieve the scarcity of tin in London. On the other hand, it has accentuated a bad situation here in America, where stocks are now down to the exceptionally low level of 1472 tons, as compared with 3340 tons at the first of the month. With spot Straits available in New York at 52.70c. and December metal at 50.75c., the situation is particularly bad inasmuch as it throws a burden on small buyers of immediate metal. The International Tin Committee is scheduled to meet in Paris on Aug. 9, at which time an advance in production quotas is expected. If the advance is made, the extra Straits metal will not reach the market much before the end of September. During the interim, a sudden demand in this country would find sellers embarrassingly short of metal.

The Week's Prices. Cents Per Pound for Early Delivery

	July 24	July 25	July 26	July 27	July 29	July 30
Electrolytic copper, N. Y.*	7.75	7.75	7.75	7.75	7.75	7.75
Lake copper, N. Y.	8.12½	8.12½	8.12½	8.12½	8.12½	8.12½
Straits tin, spot, New York	52.50	52.00	52.37½	....	52.70	52.70
Zinc, East St. Louis	4.40	4.40	4.40	4.40	4.40	4.40
Zinc, New York†	4.77½	4.77½	4.77½	4.77½	4.77½	4.77½
Lead, St. Louis	4.00	4.00	4.00	4.00	4.00	4.00
Lead, New York	4.15	4.15	4.15	4.15	4.15	4.15

*Refinery quotations; price ¼c. higher delivered in Connecticut.
†Includes emergency freight charge.

Aluminum, virgin 99 per cent plus, 19c. to 21c. a lb., delivered.
Aluminum, No. 12 remelt, No. 2 standard, in carloads, 16.25c. a lb., delivered.
Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.
Antimony, Asiatic, 12.75c. a lb., New York.
Brass ingots, commercial 85-5-5-5, 8c. a lb., delivered; in Middle West ¼c. a lb. is added on orders for less than 40,000 lb.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig	53.50c. to 54.50c.
Tin, bar	55.50c. to 56.50c.
Copper, Lake	9.00c. to 10.00c.
Copper, electrolytic	9.00c. to 9.50c.
Copper, castings	8.75c. to 9.75c.
*Copper sheets, hot-rolled	15.00c.
*High brass sheets	13.62½c.
*Seamless brass tubes	15.37½c.
*Seamless copper tubes	15.25c.
*Brass rods	12.12½c.
Zinc, slabs	5.75c. to 6.75c.
Zinc, sheets (No. 9), casks, 1200 lb. and over	10.25c.
Lead, American pig	4.62½c. to 5.62½c.
Lead, bar	5.62½c. to 6.62½c.
Lead, sheets	7.75c.
Antimony, Asiatic	13.50c. to 14.50c.
Alum., virgin, 99 per cent, plus	23.30c.
Alum., No. 1 for remelting, 98 to 99 per cent	18.00c. to 19.00c.
Solder, ½ and ½	29.50c. to 30.50c.
Babbitt metal, commercial grades	25.00c. to 60.00c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig	56.00c.
Tin, bar	58.00c.
Copper, Lake	9.00c.
Copper, electrolytic	9.00c.
Copper, castings	8.25c.
Zinc, slabs	6.00c. to 6.25c.
Lead, American pig	4.65c. to 5.00c.
Lead, bar	5.00c.
Antimony, Asiatic	15.00c.
Babbitt metal, medium grade	19.25c.
Babbitt metal, high grade	60.00c.
Solder, ½ and ½	32.75c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	5.75c.	6.50c.
Copper, hvy. and wire	5.62½c.	6.12½c.
Copper, light and bottoms	4.62½c.	5.12½c.
Brass, heavy	3.00c.	3.62½c.
Brass, light	2.25c.	3.00c.
Hvy. machine composition	4.87½c.	5.37½c.
No. 1 yel. brass turnings	4.00c.	4.50c.
No. 1 red brass or compos. turnings	4.25c.	4.75c.
Lead, heavy	2.87½c.	3.35c.
Zinc	2.25c.	2.62½c.
Cast aluminum	10.62½c.	11.75c.
Sheet aluminum	12.00c.	13.50c.

Fabricated Structural Steel

Lettings Small—New Projects in Good Volume

STRUCTURAL steel awards of 4250 tons are the lowest for any week this year and compare with 11,100 tons last week. The only bookings of size are 1000 tons for slum clearance work in the Bronx, New York, and 1000 tons for bridges in Lauderdale County, Ala. New projects of 22,600 tons compare with 9200 tons in the previous week and 9700 tons two weeks ago. Among new jobs reported are 12,000 tons for a floating drydock at Pearl Harbor, T. H., on which bids will be taken at Washington in September, 4000 tons for relocation of tracks for the Baltimore & Ohio Railroad at Grafton and Philippi, W. Va., and 1200 tons for a dam at Dubuque, Iowa.

Plate awards total 3800 tons with 22,000 tons pending, of which 20,000 tons is for a drydock at Pearl Harbor. New inquiries for sheet piling call for 10,800 tons.

Structural steel contracts in July totaled 61,150 tons, compared with 70,815 tons in June and 52,200 tons in May. Structural steel awards for the week follow:

STRUCTURAL STEEL AWARDS

NORTH ATLANTIC STATES

New Britain, Conn., 100 tons, novitiate building, to Standard Structural Steel Co.

Bronx, New York, 1000 tons, Brown Mansions slum clearance project, second unit, to an unnamed bidder.

State of New York, 260 tons, route marker supports, to American Bridge Co.

Pennsylvania Railroad, 360 tons, bridge at Fort Wayne, Ind., to McClintic-Marshall Corpn.

SOUTH AND SOUTHWEST

Lauderdale County, Ala., 1000 tons, two bridges, to Virginia Bridge & Iron Co.

Wickenburg, Ariz., 270 tons, bridge, to McClintic-Marshall Corpn.

CENTRAL STATES

Detroit, 175 tons, Bundy Tubing Co., to R. C. Mahon Co.

WESTERN STATES

Boulder Dam, Nev., 120 tons, guides, Specification 680-D for Bureau of Reclamation, to Babcock-Wilcox Co.

Long Beach, Cal., 230 tons, transit shed, to Atlas Scraper & Engineering Co.

Burbank, Cal., 605 tons, Craft's building, to Virginia Bridge & Iron Co.

Almira, Wash., 125 tons, gravel plant tripper at Grand Coulee dam, to Isaacson Iron Works.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Baltimore & Ohio Railroad, 760 tons, grade elimination on Staten Island, N. Y.

Rochester, N. Y., 300 tons, post office garage.

Tarrytown, N. Y., 200 tons, building for Chevrolet Motor Co.

Washington, 11,400 tons, Department of Interior building; George A. Fuller Co. low bidder on general contract.

THE SOUTH

Baltimore & Ohio Railroad, 4000 tons, relocation of tracks at Grafton and Philippi, W. Va.; bids Aug. 19.

Daysville, Tenn., 1100 tons, bridge over Clinch River for TVA.

Sheffield, Ala., 750 tons, power house.

CENTRAL STATES

Detroit, 325 tons, addition to Budd Wheel Co.'s foundry.

Cleveland, 450 tons, West Side housing development.

Red Wing, Minn., 900 tons, lock; Spencer, White & Prentice, low bidder on general contract.

Dubuque, Iowa, 1200 tons, dam.

State of Missouri, 1075 tons, five bridges.

WESTERN STATES

Denver, 700 tons, extension and remodeling of United States mint; United States Fireproofing Co. low bidder on general contract.

Los Angeles, 100 tons, tunnel ribs for Metropolitan Water District, Specification 41285; Commercial Shearing & Stamping Co. low bidder.

Seattle, 100 tons, material for Alaska Road Commission; bids opened.

Longview, Wash., 325 tons, bridge.

Pearl Harbor, T. H., 12,000 tons, steel floating drydock at navy yard; bids to be taken at Washington in September.

FABRICATED PLATES

AWARDS

Islip, N. Y., 200 tons, stand pipe, to Graver Tank Mfg. Co.

Stanford, Tex., 3600 tons, 20 miles of 24-in. pipe for Phillips Petroleum Corpn.; 3050 tons to Naylor Pipe Co., 550 tons to Wyatt Metal & Boiler Co.

NEW PROJECTS

Pennsylvania Railroad, 500 tons, ferry boat for Norfolk, Va.

New York, 1200 tons, five barges for Pan-American Petroleum & Transportation Co.

Atlantic, Gulf & Pacific Railroad, 180 tons, 56 pontoons.

Portland, Ore., 110 tons, motor vessel for United States Engineers; bids opened July 30.

Pearl Harbor, T. H., 20,000 tons, steel floating drydock at navy yard; bids to be opened at Washington in September.

SHEET PILING

AWARDS

Seattle, 300 tons for seawall, to Steel Fabricators, Inc.

NEW PROJECTS

Wilmington, Del., 2600 tons, for jetty; Thomas Earle & Sons low on general contract.

Miami, Fla., 4000 tons; bids taken.

Jacksonville, Fla., 800 tons; bids taken.

Dubuque, Iowa, 3000 tons, for dam.

Government Island, Cal., 2800 to 3200 tons, bulkhead for Coast Guard; bids rejected and contract will be readvertised soon.

Large Naval Projects To Be Placed on Coast

SAN FRANCISCO, July 29.—Construction and improvement programs at Navy Yards on the Pacific Coast will involve major steel tonnages. A steel floating drydock, to be constructed at the Naval Base at Pearl Harbor, T. H., will require approximately 20,000 tons of plates and 12,000 tons of structural steel. Bids are to be taken at Washington, D. C., in September from Pacific Coast concerns exclusively. Improvements to be undertaken immediately at the Navy Yard at Bremerton, Wash., call for the expenditure of $1,097,000. Approximately 2500 tons of structural steel is involved in the San Diego Naval Base improvement program.

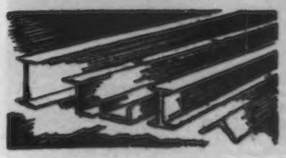
Bids taken nine months ago on the Coast Guard Service bulkhead, to be constructed at Government Island, Cal., have now been rejected and the contract will be readvertised shortly. From 2800 to 3200 tons of steel sheet piling is included in the specifications.

The attention of bar mills throughout the country is centered on Los Angeles, where the Metropolitan Water District has called bids on a contract involving the heaviest bar tonnage ever advertised on the Pacific Coast. From 72,470 to 104,640 tons of steel bars will be purchased under the different alternates.

Among the few lettings made during the past week, the award by the Metropolitan Water District at Los Angeles of 575 tons of reinforcing bars to Blue Diamond Corpn. was outstanding. Steel Fabricators, Inc., took 300 tons of sheet piling for seawall work at Seattle, Wash. Contrary to previous reports, PWA approval has not yet been received on the award of the general contract for the White Point outfall sewer, to be constructed near Los Angeles.

The County of Los Angeles will open bids during the week on 1449 tons of reinforcing bars to be used in four flood control projects. The Bureau of Reclamation will open bids Aug. 15 at Denver, Colo., for five 17-ft. radial gates and two 48-in. welded plate outlet pipes for installation at the Rye Patch dam in Nevada. Tonnages involved have not been announced. Although the actual placing of steel tonnage has been limited during the past month, work now advertised or in the offing promises to step up activity in the near future.

Philadelphia Rate Continues to Lag Behind National Average



Operations Remain at 28 Per Cent, With No Significant Change Impending—Scrap Strengthens Despite Poor Buying Support

PHILADELPHIA, July 30.—By far the most significant feature in this area is a wide-spread expectation of good business to materialize in the near future and continue on through the turn of the year. Maintenance of prices is now an accepted fact, and district sales offices are looking forward to parent mills cancelling some of the past financial losses during the fall period. The good feeling prevailing in eastern Pennsylvania is, however, to a great extent a mirroring of the attitude of operators at Pittsburgh, Cleveland and Detroit. For operations here remain very low at 28 per cent of district capacity, and orders on hand and in prospect are none too encouraging.

Miscellaneous bookings have shown a definite improvement during the past week. Whether this is the beginning of the anticipated fall rise or whether it is merely an isolated spurt cannot yet be determined. This new business, of course, continues to be of a carlot variety for quick shipment as consumers have no incentive to buy in larger quantities. Heavier ordering has failed to materialize, and the larger steel consumers remain noncommittal regarding future ordering. Some mills look for a revival of railroad buying, but the carriers themselves point to decreased earnings and hold out no hope for purchasing in excess of skeleton routine requirements.

New York Shipbuilding Co., Camden, N. J., is still tied up with a strike. Over $48,000,000 of Navy vessels are uncompleted on this company's ways. Consequently no attempt will be made to bid on 13 new Navy vessels coming up on Aug. 7. Thus a portion of the 24,000-ton steel requirements will be lost to this territory.

It is expected that some Pennsylvania and New Jersey highway construction will get under way by late August. This should mean better business in nearby structural mills, but the PWA announcement that foreign steel must be bought where a 15 per cent price concession is available has discouraged makers to some extent. However, this threat of foreign competition is not so severe as it may seem. Not much steel is currently being offered 15 per cent below the market and, in addition, legislation is pending which would swing much of the PWA buying to domestic mills adhering to code-established wage and hour schedules.

Sheet and Strip

Blue-annealed sales continue moderately steady, but total tonnages involved are still far from satisfactory. No large purchases of full-finished material have yet been consummated, but several small lots have been ordered for die trials. Tenders on 250 tons of license tag stock for Pennsylvania will be opened tomorrow, which is now the only important tonnage out for general bidding. The strip steel needs of this area continue to be very modest, with little possibility of heavier tonnages developing in the near future. Tin plate is slightly more active, with possibilities of a greater outlet in beer cans more promising each day. Crown Cork & Seal Co., Baltimore, is installing equipment to turn out 1000 of these cans each minute—these cans will probably be a variation of the now familiar food can type, inasmuch as a regulation bottle cap will be used. In anticipation of greater demand in the East for cold-reduced tin plate, Bethlehem is pushing forward the installation of $5,000,000 worth of continuous cold-rolling equipment at its Sparrows Point, Md., plant.

Pig Iron

Jobbing foundries have definitely improved their carlot ordering, and total July bookings and shipments should now easily equal those for June. There is still no speculative buying and shipments about equal actual consumption. Prices are very steady despite increasing competition from certain lower-priced foreign brands. Foundries supplying the machine tool industry are currently very busy. Likewise makers of oil furnaces report heavier assemblies, with consequent improvement in the output of their foundries.

Bars, Plates and Shapes

No shape tonnage was awarded during the week, but tonnages in prospect have expanded considerably. George A. Fuller will soon award 11,400 tons for the Department of Interior building at Washington, in addition to which 3400 tons of bars will be let. Likewise, Thomas Earle & Sons expect to make an early award of 2600 tons of piling for the Army jetty at Wilmington. The post office at Atlantic City has been extended to Aug. 9, and the Reading post office will be bid in on Aug. 27. Plans

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P&H ELECTRIC HOISTS

are out for an extension to the archives building at Washington, requiring 2500 tons, and other miscellaneous projects up for bidding in this area total about 600 tons. The reinforcing bar market continues inactive. A bridge in southern New Jersey requiring 100 tons is the only new project. Miscellaneous plate demand continues well above early July levels. The only new large tonnage in prospect is 1080 tons for the Virginia Ferryboat Corpn., on which 10 bidders have already submitted figures. An award is expected next week. No disposition of the Gulf Oil tankers has yet been made.

Imports

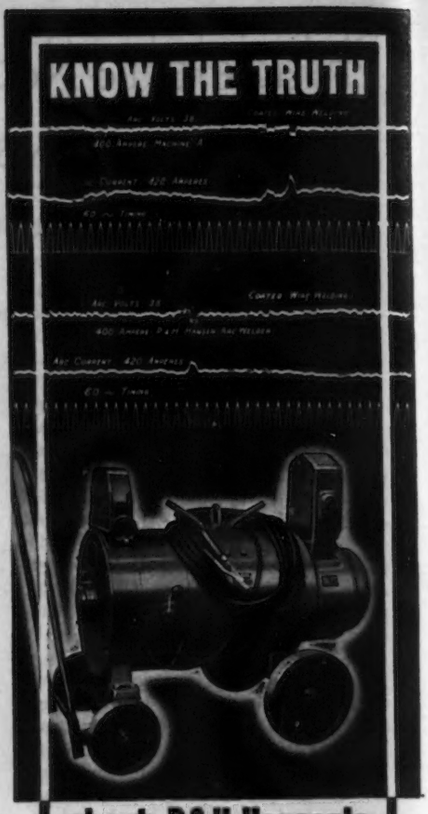
The following iron and steel imports were received here last week: 50 tons of ferromanganese from Poland; 32 tons of manganese ore from England, and 3 tons of steel bars and 2 tons of steel bands from Germany.

Scrap

Two district mills have purchased a fair tonnage of No. 2 at $10, and two local brokers shared in a sizeable No. 1 sale at $11. Consequently these two important grades have been marked up 50c a ton, with bundled sheets also up in sympathy. The rises in domestic prices have forced export deliveries to Port Richmond almost out of the picture. Only a few carlots from nearby dealers are going to that point; so brokers' prices for export delivery are being temporarily discarded in THE IRON AGE scrap list. Brokers are paying as high as $9.50 for coverage on old No. 2 contracts and heavy axle turnings are being used in some cases to round out No. 2 tonnages. This latter grade, consequently, has also staged a 50c advance. Loose bundled sheets are now priced at $9.50 to $10, with one broker none too willing to sell at the higher figure.

Although this market has a pronounced firmness, it is still mostly a dealer-inspired market. Local mills have their modest requirements fairly well covered, and new business should not materialize to any great extent for at least several more weeks. Alan Wood is still the only mill with a definite fall backlog, whereas other melters are still waiting for heavier finished steel bookings before engaging in any heavy forward scrap commitments.

United States Engineer Office, Pittsburgh, asks bids until Aug. 19 for relocation of Baltimore & Ohio Railroad lines for Tygert River reservoir, West Virginia, totaling about 12 miles of track, including 1,500,000 lb. of structural and reinforcing steel, well casing, water tank, culvert pipe, corrugated iron pipe, etc. (Circular 19).



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P&H HANSEN ARC WELDERS

Operations in Cleveland Area Reach 45 Per Cent

Eight-Point Rise in Output Is Chiefly Due to Heavier Miscellaneous Demand—Scrap Prices Advance

CLEVELAND, July 30.—Demand for finished steel is increasing moderately, though not spectacularly, and steel ingot production in the Cleveland-Lorain district has been stepped up eight points to 45 per cent of capacity. The Corrigan, McKinney Steel Co. added two furnaces to the active list late last week and is lighting two more today. Raw steel production at other plants is scarcely sufficient to supply finishing mill requirements and a further rise in output is likely during August.

July orders for practically all finished products were ahead of the June totals and make a particularly satisfactory showing when compared with July of last year, when demand was extremely light. However, business has not yet reached substantial levels, and August is expected to bring the really significant upturn. Recent gains in demand have been attributable almost entirely to small miscellaneous orders, and large inquiries from the automobile industry are not expected to come along for another two weeks.

The heavy hot-rolled products are rather quiet and mills in this district did not share heavily in the steel requirements for the Chesapeake & Ohio freight cars. The Nickel Plate has placed 4000 tons of rails, but no inquiry from the Chesapeake & Ohio has appeared. This road will likely come into the market in a month or six weeks and may buy as much as 30,000 tons.

Demand for flat-rolled steel products is only moderately active. Makers of stoves and signs are increasing their requirements, but refrigerator makers are reaching the end of their busy season. The Ford Motor Co. placed several thousand tons of cold-rolled sheets last week, and is still reported to have an inquiry with the mills for 100,000 tons or more. However, the trade is inclined to believe that this tonnage is being offered largely as a test of the market and that the company has no immediate need for the steel.

Pig Iron

The improvement in pig iron demand which began to be felt about the middle of the month is being well sustained. Shipments and sales are running ahead of June, and July will show a considerable gain over the preceding month. While the automobile industry is accounting for a good part of the increased business, orders during the last week have come from more diversified sources. A number of foundries are down for midsummer vacations, but are accumulating enough orders to resume during August at a higher rate than they were running before suspensions. Prices have been tested on lots of 1000 tons and have held firmly.

Sheets

While orders have been heavier during the past week, the improvement has not been so marked as has been reported in other districts. With the exception of the Ford Motor Co., which recently placed substantial orders for cold-rolled sheets, the automobile industry is not in the market in large volume. Orders from this source are about equally divided between old models and new. The demands of the refrigerator industry are contracting according to seasonal expectations, but makers of stoves and signs are more active buyers. Producers of building products are also taking steel more liberally than was the case last month. July sheet business in this district is running well ahead of June, and the local mill is engaged at about 65 per cent of capacity. The Monroe, Mich., unit is running at a much higher rate.

Strip Steel

The market is slightly more active, but awaits the placing of large automobile orders before it can take on real life. Barrel makers are a little busier, but are buying only for their immediate needs. Prices are well maintained on the small run of orders reaching mills and no large tonnages have appeared to offer a real test of the market.

Reinforcing Bars

While a considerable tonnage of bars is pending in connection with the Easterly disposal plant at Cleveland and the Muskingum Conservancy Commission at Zanesville, Ohio, no awards have been reported during the past week. General contractors are watching the price situation closely since weakness has become apparent and

"HERCULES" RED-STRAND REG. U.S. PAT. OFF. WIRE ROPE

Furnished in Flattened Strand, Round Strand, Preformed, Steel Clad and Non-Rotating constructions.

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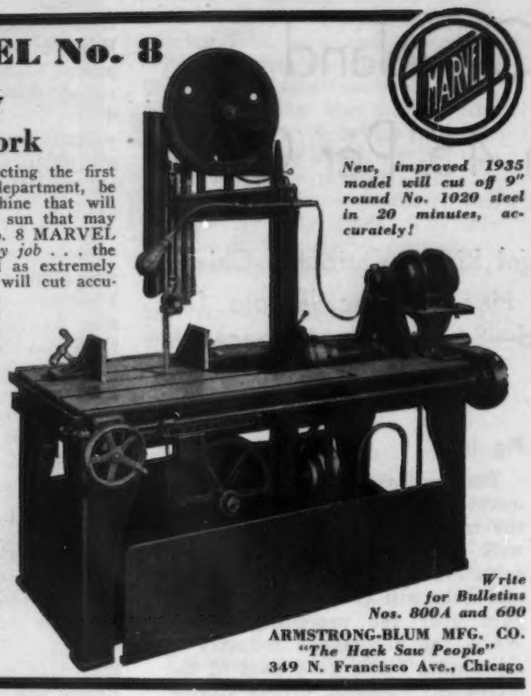
Band Saw

for *universal* work

When you face the problem of selecting the first saw for each individual shop or department, be sure you equip with the only machine that will "handle every sawing job under the sun that may arise in that shop"—the *universal* No. 8 MARVEL Metal Band Saw that will handle *any job* . . . the lightest, most delicate work, as well as extremely large and heavy work to 18"x18"; will cut accurately, straight and square; will cut at any angle, to 45 degrees to right or left; will do notching, blocking, coping and roughing-out work. With a No. 8 MARVEL, no job will "stump" you.

As builders of a most complete line of saws, we unhesitatingly recommend "a No. 8 MARVEL Band Saw first."

Later, when that shop gets into highly specialized quantity production, you will also need a MARVEL Fully Automatic Production Hack Saw that will cut off bar steel into short lengths for gear blanks, steel parts, forgings, etc., ***automatically*** at speeds as high as 6 square inches per minute, floor to floor. Your ***first*** saw, though, should be a MARVEL No. 8 Universal Band Saw.



New, improved 1935 model will cut off 9" round No. 1020 steel in 20 minutes, accurately!

Write for Bulletins Nos. 800A and 600

ARMSTRONG-BLUM MFG. CO.
"The Hack Saw People"
349 N. Francisco Ave., Chicago

are now inclined to shop around considerably before buying.

Bars, Plates and Shapes

Mills in this district shared in the orders for accessories required for the Chesapeake & Ohio freight cars, but the heavy tonnage went to Pittsburgh and Chicago district mills. Demand for plates from other sources is rather quiet. Bars are relatively more active and many small orders from widely diversified sources are reaching mills. Machinery and equipment makers are busier than they have been for five years and are taking sizable tonnages of both carbon and alloy bars. Fabricating shops are booking a number of small structural steel orders, but the tonnages involved are not large. No action has been taken on a number of jobs in connection with the Easterly disposal plant at Cleveland and a substantial tonnage is still pending for the Muskingum Conservancy District.

Scrap

The market on open-hearth grades has strengthened here, largely because of higher dealer bids to cover old orders in the Valleys. No. 1 heavy melting steel is now quotable at 10.50 to $11 a ton and the other steel-making grades are up 50c. a ton also. Mills in this district are not yet showing much interest in the market, but dealers expect more buying next month. The blast furnace grades are 25c. a ton higher. Foundry scrap is in fair demand, and, while prices are stronger, no definite increases are reported.

Reinforcing Steel

Awards 1525 Tons—New Projects 6000 Tons

AWARDS

Montague, Mass., 100 tons, bridges, to Northern Steel Co.

Mumford, N. Y., 125 tons, grade crossing elimination for Baltimore & Ohio Railroad, to Genesee Bridge Works.

Newark, N. J., 180 tons, Sherwin-Williams Co. addition, to Austin Co.

Washington, 100 tons, Christ Lutheran Church addition, divided between Concrete Steel Co. and Acme Steel Engineering Co.

Chicago, 100 tons, parochial school, to Inland Steel Co.

Los Angeles, 575 tons, for Metropolitan Water District, to Blue Diamond Corpn.

Seattle, 100 tons, Ballard trunk sewer, to Northwest Steel Rolling Mills.

State of California, 242 tons, highway work in eight counties, to unnamed bidders.

NEW REINFORCING BAR PROJECTS

Dartmouth, Mass., 115 tons, highway bridge.

Newark, N. J., 115 tons, highway, route 21 section 4A; bids at Trenton on Aug. 12.

State of New Jersey, 100 tons, Delilah bridge; tenders on Aug. 5.

Oneida County, N. Y., 275 tons, mesh for highway; bids Aug. 13.

Washington, 3400 tons, Department of Interior building; George A. Fuller Co. low bidder on general contract.

McHenry, Ill., tonnage being estimated, sewage disposal plant.

Des Plaines, Ill., 100 tons, sewage disposal plant.

Red Wing, Minn., 900 tons, lock; Spencer, White & Prentice low bidders on general contract.

Dubuque, Iowa, 550 tons, dam.

St. Louis, 220 tons, Nurses Home at city hospital for colored; bids opened July 30.

Los Angeles, 506 tons, Verdugo Wash conduit between Kenilworth Avenue and Los Angeles River; bids taken July 31.

Los Angeles, 122 tons, Pickens Canyon and Hall Beckley debris basins; bids taken July 31.

King County, Wash., 100 tons, State paving; bids opened July 30.

Blast Furnace Lighted At Buffalo

BUFFALO, July 30.—The blast furnace of the Tonawanda Iron Corpn., American Radiator Co. subsidiary, was scheduled to go into blast today. This brings the total number of active stacks in the district up to seven.

Pig iron business is quiet but shows a comparatively good summer volume.

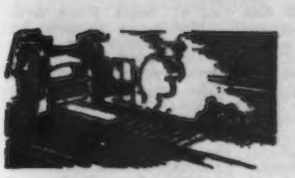
Nine open-hearth furnaces are in operation at the Lackawanna plant of the Bethlehem Steel Co., three at the Republic Steel Corpn., and one at the Wickwire-Spencer Steel Corpn. The Seneca sheet division of the Bethlehem Steel Co. is operating at about 50 per cent of capacity.

Award of a contract for 125 tons of reinforcing bars for the Baltimore & Ohio grade crossing job at Mumford, N. Y., has been made to a Rochester concern.

The scrap market is exceptionally strong, with plenty of action probable within the next few weeks. Buffalo dealers are certain the price of scrap will undergo a substantial increase, because they can now ship out of Buffalo netting a better price than by selling locally. It is almost certain that any purchase of No. 1 heavy melting steel in sizable quantity in the near future will bring out a price of $12 a ton. Youngstown is now offering better than $12 a ton for No. 2 steel. With new model automobile production scheduled to go ahead earlier this year, dealers believe Buffalo mills will be obliged materially to augment current stock piles.

R. E. EMERY, president of Jessop Steel Co., Washington, Pa., has announced the installation of two additional furnaces in the company's plant at Washington, Pa., to meet an increased demand for tool and die steels. One furnace is a thermostatically controlled annealing type and the other is an electrically operated melting furnace.

Tin Plate Demand Falls Off at New York



July Bookings, However, Compare Favorably With June—Foreign Steel Prices Hit Low Levels

NEW YORK, July 30.—Finished steel demand has declined largely because of a reduction in tin plate bookings. New business in tin plate from now on is expected to be mainly of a fill-in character, since the can companies have already covered for their estimated requirements for the remaining packs of the year. Shipping orders as distinguished from manufacturing orders will, of course, remain at a good rate for some time to come.

Total bookings in July compare favorably with those for June for most companies selling in this district. For those who have participated in recent steel orders from railroad car builders and for those who have been taking tin plate business July was a better month than June.

Foreign steel is becoming more of a competitive factor, especially in bars and bar-size shapes. Foreign flats 1½ x ⅜ in. and rounds up to 1 in. are being sold as low as 1.60c., New York dock, duty paid. Concern lest foreign material be bought for works relief projects is probably premature. A bill introduced in Congress by Senator Walsh of Massachusetts, which is slated for passage by the Administration, stipulates that all material bought for Government projects be made in plants observing wage and hour standards that existed under the code regime. This would bar foreign material.

The Norfolk Southern has bought 500 all-steel box cars from Pullman-Standard Car Mfg. Co. Approximately 5000 tons of plain material will be required. The Argentine State Railways are in the market for 1000 box cars, requiring 8000 tons of plates, shapes and bars and 4000 axles. The Ergoli Filyus Railway, Turkey, is inquiring in this country for cars which will take 2700 tons of plates, shapes and bars, together with about 1000 axles.

The Pan-American Petroleum & Transportation Co., New York, is in the market for five barges, requiring 1200 tons of plates. The Pennsylvania Railroad is inquiring for a ferry boat to operate at Norfolk, Va., requiring 400 tons of plates, and Virginia Ferry Corpn. is in the market for a ferry boat requiring 500 tons.

Standard Oil Co. of New Jersey is asking for prices on storage tanks for domestic oil burners requiring 3100 tons of heavy sheets.

Pig Iron

Production foundries in New Jersey are melting in somewhat heavier volume, but jobbing foundries are barely holding their own. Aggregate district melt, therefore, is slightly better than in June. Sellers of iron are encouraged by the number of repeat orders from smaller foundries, and are looking forward to heavier ordering in August as melters build up their stocks in preparation for fall business. Total sales in this area during the past seven-day period amounted to 1550 tons, as compared with 1650 tons in the preceding period and 1350 tons booked in the period two weeks earlier. The Troy furnace will go into blast this week and will continue in production through the fall period. Whether the furnace remains in blast the entire winter will, of course, depend on the pickup in Eastern business.

Reinforcing Steel

Distributor sales are mostly confined to small lots, but tonnages in prospect are somewhat encouraging. All mill prices are firm. Nevertheless secondary sellers continue to grant concessions on extras and service charges. Concrete Steel Co. and Acme Steel Engineering Co. have been awarded 100 tons for a church building at Baltimore. Also, the Austin Co. will furnish 180 tons for a Sherwin-Williams building at Newark. New projects include 275 tons of mesh for a highway in Oneida County, N. Y., 115 tons for a State highway at Newark, N. J., and 115 tons for a bridge at Dartmouth, Mass.

Scrap

With important grades very strong in Pittsburgh, many local dealers are curtailing deliveries to export piers. Most brokers feel that an advance in pier prices would not draw out more supplies and, consequently, No. 1 and No. 2 are still retained at $8.50 and $7.50 a ton respectively for truck loads alongside barges. Enough material is coming out at these levels to take care of boat schedules, and it is quite possible that deliveries abroad will soon show a material decrease, since backlogs are rapidly being liquidated. Japan has not come into the market for new supplies, and Italy is finding it increasingly difficult to obtain foreign exchange to pay for scrap deliv-

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WYCKOFF
SPECIAL SHAPES
reduce machine time

WYCKOFF regularly produces a large number of special shapes from standard bars which materially reduce machining costs and eliminate excess scrap.

Wyckoff engineers will gladly cooperate with you in checking the possibilities of special shapes in your operations.

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General Offices: First National Bank Bldg., Pittsburgh, Pa.
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eries. Thus, it is quite possible that foreign scrap business may soon become less of a factor than it has been for several years. Turnings continue to go from this district to Pittsburgh. No steel has yet gone west, but if prices in Pittsburgh continue to rise this situation may soon be altered.

Pipe Lines

Standard Pipeline Co., Shreveport, La., plans 8-in. welded steel pipe line from oil field district at Rodessa, La., to Ida, La., where cain pumping station is located, about eight miles, for crude oil. Cost close to $65,000. F. R. McGrew is president.

Minot, N. D., plans welded steel pipe line from Williston, N. D., to city, for natural gas supply, securing service from last noted district. Cost about $1,500,000. Financing will be arranged through Federal aid. Minot Gas Co., Minot, is interested in project. J. B. Schmidt, city auditor, is in charge of financing.

Central Counties Municipal Utilities District, Lindsay, Cal., Charles F. Burr, mayor of Lindsay, chairman, recently formed by affirmative vote of citizens of Lindsay and Tulare, plans welded steel pipe line from Kettleman, Cal., oil field district to municipalities for natural gas supply, about 47 miles, including distributing mains. Project includes about two miles of 6-in., eight miles of 4-in., and 37 miles of 2-in. pipe. Cost about $228,820. Bond issue will be arranged soon. H. L. Hinkel, Lindsay, is consulting engineer.

Union Light, Heat & Power Co., Court Street, Covington, Ky., plans extensions in steel pipe lines for gas supply in parts of Kenton County and at South Fort Mitchell, Ky., where franchises are being secured.

Bureau of Reclamation, Denver, asks bids until Aug. 15 for two 48-in. diameter welded plate-steel outlet pipes for Rye Patch Dam (Specification 703-D).

Citizens Gas Co., 47 South Penn Avenue, Indianapolis, now being acquired by city as a municipal property for about $6,500,000, plans welded steel pipe line to connection with steel pipe system of Panhandle Eastern Pipe Line Co., 101 West Eleventh Street, Kansas City, Mo., about 10 miles from Indianapolis, for natural gas supply. Panhandle line extends from Texas natural gas fields to Dana, Ind., and vicinity. Indianapolis has arranged bond issue of $8,000,000 for purchase of Citizens company, providing fund of $1,500,000 over purchase price for extensions and improvements in pipe lines for main transmission and distribution, including natural gas facilities noted.

Output Unchanged In South

BIRMINGHAM, July 30.—Current steel and pig iron business still consists mostly of small routine orders to cover immediate requirements. Buyers are showing no inclination to change from a hand-to-mouth basis. July was a dull month, but producers are hopeful of an improvement in August, with an acceleration in public works expenditures. July shipments of pig iron were below those of June. Lately there has been a slight upward trend, which should make August a better month.

July was a disappointment to pressure pipe producers. Lettings were few and most orders were in one and two carlots. Local plants are operating about three days a week, with part of the production going into stocks. The outlook for August is not much better. Guthrie, Okla., which rejected bids July 15 on a project requiring about 600 tons, is expected to call for new bids in the next week or so.

Ingalls Iron Works have been awarded contract for construction of a small ferry barge by the Tennessee Valley Authority, to cost $6,535. Steel will be fabricated in Birmingham and assembled at the company's Decatur, Ala., plant on the Tennessee River. Virginia Bridge & Iron Co. is fabricating steel for two bridges in Lauderdale County, Ala., previously reported, which will take about 1000 tons. One bridge is for the TVA over Elk River and the other for the State highway department over Second Creek.

Six blast furnaces and seven open-hearth units are operating, no changes having been made in the last several weeks. Sloss-Sheffield is making some repairs on its No. 1 furnace and will likely blow it in at an early date, which will give the company two active stacks.

Bar Extras Revised By Carnegie Steel Co.

CARNEGIE STEEL CO. announces preparation of a set of standard classifications of extras for all its products. These cards will take the form of separate pamphlets for each major product, the first of which will cover carbon steel bars and small shapes to become effective Aug. 10 and will be ready for distribution within a few days.

In general, the extras in this pamphlet will follow closely those now in effect, a few adjustments being made primarily to bring them more nearly in line with manufacturing costs. The following are the most important changes.

The extra previously charged for forging quality has been eliminated and the extras for special requirement quality bars and special carburizing steel have been reduced to $5 per net ton.

A revision has been made in size extras on rounds, squares, round-cornered squares, and gothic sections in sizes from 1 9/16 to 4 1/16 in. inclusive, and a similar adjustment has been made in extras on a limited range of the heavier bar-size flats.

A table for extras for silicon has been revised to a basis of minimum limits and broadened to include a range of 0.15 to 0.30 per cent silicon.

Extras not previously provided will be published for a number of sizes of light angles, restricted ranges in phosphorus and sulphur, and three classifications of restricted physical test requirements.

A Mile a Minute with a DURIRON Fan

A Duriron No. 500 acid-resisting Exhaust Fan will move air at the rate of 5,000 cu. ft. per min. It will completely change the air in a room 20 ft. square by 12½ ft. high in one minute.

And if the air is in your plant and consists of corrosive fumes, as from pickling or plating tanks, wouldn't it be to your advantage to have those fumes exhausted where they wouldn't do any damage?

There are five different sizes of Duriron acid-resisting fans that will handle corrosive fumes without being corroded by them. You can put these fans to work and forget about them except for an occasional oiling of the motor. And you and your men get the benefit every day the pickling room is working.

Send for Bulletin 166, which contains drawings and capacity tables.

THE DURIRON COMPANY, Inc.

438 N. Findlay St. Dayton, Ohio

Cast Iron Pipe

Springfield, Mass., has awarded 600 tons of 24-in. to R. D. Wood Co.

Newton, Mass., has purchased 500 tons of 12-in. from Warren Foundry & Pipe Corpn.

Quincy, Mass., has placed 200 tons of 10 and 12-in. with Warren Foundry & Pipe Corpn.

Suisun, Cal., plans pipe line installations for water system, replacing present mains. Fund of $37,000 is being arranged through Federal aid. Clyde C. Kennedy, Call Building, San Francisco, is consulting engineer.

Richmond, Ky., plans water pipe lines, including replacements in present system. Fund of $150,000 is being arranged through Federal aid. J. S. Watkins, Lexington, Ky., is consulting engineer.

Ebenezer, S. C., plans pipe lines for water system. Special election has been called Aug. 6 to vote bonds for $15,000 for work.

Kensett, Iowa, plans pipe lines for water supply. Fund of $20,700 is being arranged through Federal aid for this and other waterworks installation.

Cedar Bluff, Va., plans about four miles of 3 and 4-in. for water line from new reservoir, soon to be constructed. A. S. Hodges, Cedar Bluff, is engineer.

Carrier Mills, Ill., plans pipe lines for water supply. Fund of about $160,000 will be arranged through Federal aid for this and other waterworks construction. Russell & Axon, 4903 Delmar Boulevard, St. Louis, are consulting engineers.

Oostburg, Wis., plans pipe lines for water system. Fund of $54,600 is being arranged through Federal aid for this and other waterworks installation. Jerry Donohue Engineering Co., 608 North Eighth Street, Sheboygan, Wis., is consulting engineer.

Galena, Mo., plans about four miles of 2, 4, 6 and 8-in., for water system, recently referred to in these columns; also 50,000-gal. elevated steel tank on 50-ft. tower and pumping equipment. Fund of $40,000 is being arranged. G. W. Fletcher, 417 South Robertson Street, Springfield, Mo., is consulting engineer.

Hardin, Tex., plans pipe lines for water supply. Fund of $48,750 is being secured through Federal aid for this and other waterworks installation.

Quindaro Township, Kan., near Kansas City, Kan., care of Charles A. Haskins, Finance Building, Kansas City, Mo., consulting engineer, plans pipe lines for water supply at White Church and Washington rural districts, including distribution systems, elevated steel tanks and towers, and other waterworks equipment. Fund of $200,000 is being arranged through Federal aid.

East Orange, N. J., plans trunk water pipe line from reservoir at Maplewood, N. J., to city. Cost close to $150,000. Runyon & Carey, 33 Fulton Street, Newark, N. J., are consulting engineers.

Bloomfield, Ky., plans about 15,000 ft. of 2 to 8-in. for water supply; also 75,000-gal. tank and other waterworks equipment. Surveys and estimates of cost are being made by J. S. Watkins, Citizens Building, Lexington, Ky., consulting engineer.

Dierks, Ark., plans pipe lines for water system. Fund of $54,700 is being arranged through Federal aid for this and other waterworks installation.

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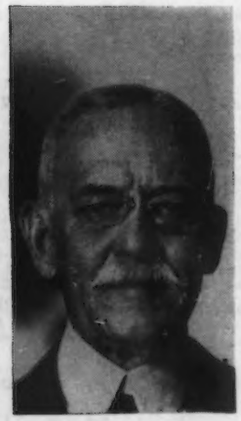
OBITUARY

WILLIAM BACON SCHILLER, former president of National Tube Co., Pittsburgh, died at his home at Sewickley, Pa., on July 25. He was born in Pittsburgh in 1859, and received his formal education in the public schools of Youngstown, Ohio. In 1876 he entered the employ of R. W. Hitchcock & Co., Youngstown grain merchants, as an office boy, and acquired commercial knowledge sufficient to enable him two years later to become a bookkeeper in the Second National Bank, Youngstown. Four years later he left the bank to go with the Brier Hill Iron & Coal Co., first as bookkeeper and a few months later as secretary. In June 1886, he became treasurer and general manager of the Bessemer Limestone Co., and the Youngstown Coke Co., Ltd. In 1889, he became general manager of Monongahela Furnace Co., McKeesport, Pa., which was organized that year and in 1892, when it was absorbed by the National Tube Works Co., he was made manager of the blast furnaces and steel works. Upon the organization of the National Tube Co. in 1899 he was appointed manager of the National department embracing all productive capacity of the company in McKeesport. In April, 1900, he was made assistant first vice-president and about a year later was elected first vice-president to fill the place made vacant by the death of Horace Crosby. In 1902, he was elected president, succeeding Frank J. Hearne, who resigned to become president of the Colorado Fuel & Iron Co., and remained in that position until April 19, 1926, when he retired.



W. B. SCHILLER

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CHARLES G. HEER, treasurer of the Cleveland Cliffs Iron Co., died suddenly of a heart attack, July 24, aged 55 years. He had been associated with the company for 30 years, beginning in a secretarial position and subsequently becoming secretary to WILLIAM G. MATHER, who was then president of the company. He was elected treasurer in 1918 and later a director. He was also a director and treasurer of the Cleveland Cliffs Steamship Co., treasurer of the Cliffs Corpn. and McKinney Steel Holding Co., and treasurer and director of the Lake Superior & Ishpeming Railroad Co.

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MAURICE L. BURGHAM, sales engineer for the past nine years of the Edgewater Steel Co., Pittsburgh, died July 19 at the Homeopathic Hospital in that city after an illness of two months. Mr. Burgham was born April 3, 1901 at Parnassus, Pa. He was graduated from the University of Pittsburgh in the School of Engineering in 1923. He held a second lieutenancy in the Officers' Reserve Corps of the United States Army.

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ALBERT CLARK LEHMAN, chairman of the board of the Blaw-Knox Co., Pittsburgh, and founder of its original unit, died at his home in that city on July 24, aged 56 years. He was born in Pittsburgh on Oct. 14, 1878, and was educated in the public schools, later attending the Stone School at Boston and Harvard University. Five years after his graduation from Harvard he organized the Blaw Collapsible Steel Centering Co., original unit of the Blaw-Knox Co., and it has grown into one of the leading independent fabricators of steel specialties. Mr. Lehman served the company first as vice-president, and later as president, continuing in this capacity until recently, when he was elected chairman of the board.

Besides his position as director of the Blaw-Knox Co., Mr. Lehman was on the board of a number of subsidiary and affiliated companies, including the Blaw-Knox Construction Co., A. W. French & Co.,

A. C. LEHMAN

Hoboken Land Co., Blaw-Knox International Corpn., Lewis Foundry & Machine Co., Groveton Land Co., Blaw-Knox, Ltd., Milliken Brothers, Ltd., and Compagnie Française Blaw-Knox. He was also a director of the Pittsburgh Rolls Corpn., the Union Steel Casting Co. and the National Alloy Steel Co.; of the Manufacturers Trust Co. of New York, and the Union National Bank of Pittsburgh. Mr. Lehman was a trustee and a member of the finance committee of the Carnegie Institute of Technology.

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RICHARD P. ZINN, Michigan manager of mines for Pickands, Mather & Co., died suddenly, July 22, of a heart attack. He was born in Marinette, Wis., in 1886, and joined the Newport Mining Co. at Ironwood, Mich., in 1909, going with the Pickands organization when it took over the Newport property, and taking charge of all mines on Jan. 1, 1931. Mr. Zinn served several terms as mayor of Ironwood.

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ASHTON G. BEAN, who retired May 1 as president of the White Motor Co., Cleveland, to become chairman of the board, and chief receiver for the Studebaker Corpn. before its receivership was lifted, died suddenly at his home in Elyria, Ohio, July 19, from a heart attack, aged 63 years. He had been president of the Bishop & Babcock Mfg. Co., Cleveland, for many years. Starting his business career in the banking field in St. Louis, Mr. Bean transferred his activities to the industrial field in 1900 when he became treasurer of the Bean Mfg. Co., Elyria, Ohio, which later became General Industries, Inc.

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HERBERT L. CARY, assistant auditor of the American Steel & Wire Co., died July 17, aged 57 years. His death occurred in Chicago where he had been located for some time. Mr. Cary had been connected with the American Steel & Wire Co. and a predecessor company since 1893, and had been located at numerous plants of the company where he was engaged in a wide variety of accounting services. He had been assistant auditor for 16 years.

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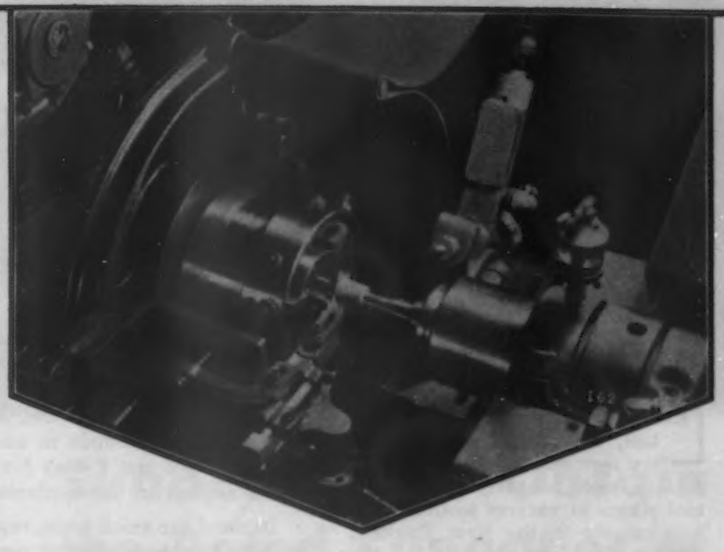
THOMAS RICE VARICK, treasurer of the John B. Varick Co., Manchester, N. H., died at his home in that city Monday, July 22, aged 71 years. After attending Phillips Exeter Academy, he was graduated from Harvard University in 1887. During his most active business years he was president of a savings bank, and a director of a national bank and gas company.

THAT'S THE SIZE OF IT



You can be certain it is. The size the drawing called for. Within the limits specified. What's more, each successive piece will be to size with like accuracy.

The reason for all this is the Landis-Solex Sizing Device—an outstanding feature of the new Landis Type C 15″x8″ Hydraulic Internal Grinder. This device is accurate within exceedingly close limits. Automatic in operation of course. May be used for straight or tapered holes, whether open or blind. Is highly flexible, easily set.

There is more about it in your copy of catalog E-35. 193

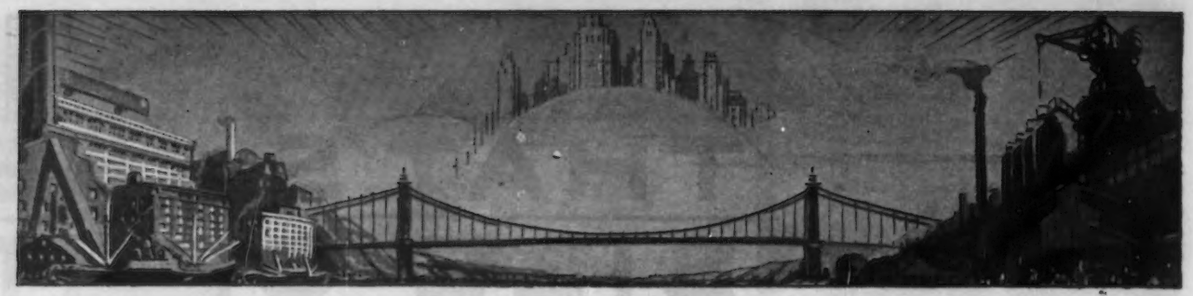
LANDIS TOOL CO.
WAYNESBORO, PA.

Reading Reaffirms Resale Pipe Prices

THE Reading Iron Co., Reading, Pa., has reaffirmed its policy with respect to the resale prices of Reading puddled wrought iron pipe whereby it may refuse to make further sales of such pipe to any jobber who shall fail to observe the minimum resale prices suggested by the Reading company.

In order to make clear its legal right to declare and enforce this policy, the company quotes, on advice of counsel, from a decision of the United States Supreme Court which decided that a manufacturer ". . . may withhold his goods from those who will not sell them at the prices which he fixes for their resale."

George G. McDonald, 1017 Republic Bank Building, Dallas, Tex., has been made sales representative for the hardware and mill supply trade in Texas, Oklahoma and Arkansas for the Columbus-McKinnon Chain Corpn., Tonawanda, N. Y.



Plant Expansion and Equipment Buying

Capital Goods Revival Well Under Way

LED by its bell-wether, the machine tool, the capital goods industry seems definitely headed for its long hoped for revival. Machine tool plants in various sections, and particularly in the New England district, are once more facing the problem of deliveries instead of that of orders.

International Harvester Co. has practically completed its buying against its Milwaukee list, but it is reported that funds in addition were released last Friday for tools for a number of other plants.

Demand for small tools, reported as active in these columns recently, has taken another spurt during the past week. This is looked upon as a forerunner of increased interest in large tool replacement.

NORTH ATLANTIC

Pan-American Petroleum & Transport Co., 122 East Forty-second Street, New York, plans additions to oil refinery at Texas City, Tex., with additional equipment to double present capacity. Work will begin early in fall. Cost over $1,000,000 with machinery. Contract for structural steel buildings has been let to McClintic-Marshall Corpn., South Bethlehem, Pa.

Department of Hospitals, City of New York, Municipal Building, plans new steam-operated electric power plant for light and power supply, and central steam-heating service at Neponsit Beach Hospital; also will build new one-story machine shop and mechanical laundry plant at same institution. Fund of $215,181 has been secured through Federal aid for project.

Silvray Lighting, Inc., 55 West Fourteenth Street, New York, manufacturer of lighting equipment, has leased about 20,000 sq. ft. in building at Nelson Avenue and School Street, Long Island City, for new plant, including storage and distributing divisions.

Continental Can Co., 1 Pershing Square, New York, plans expansion at branch plant at Houston, Tex., including new equipment for production of tin containers for beer and other liquids.

Mack International Motor Truck Corpn., 25 Broadway, New York, with main plants at Plainfield and New Brunswick, N. J., has approved plans for new multi-story building at 604 West Forty-third Street, New York, to be occupied under lease, for which general contract has been let to Turner Construction Co., 420 Lexington Avenue. It will be used for new metropolitan factory branch, storage and distributing plant, with parts and repair departments. Cost about $125,000 with equipment. Elwyn E. Seelye & Co., 101 Park Avenue, are consulting engineers.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Aug. 6 for 32 air ejectors for Brooklyn and Philadelphia navy yards (Schedule 5621); until Aug. 9, 28 combustible gas indicators for Brooklyn yard (Schedule 5657).

H. Hertzberg & Son, 41 East Eleventh Street, New York, manufacturers of wire brushes and allied products, have acquired five-story factory and two-story building adjoining, on site 115 x 240 ft., at Southern Boulevard and 137th Street, Bronx, and will improve for new plant. Adjacent land, 60 x 100 ft. has also been acquired on which an addition will be erected. Company will remove present works to new location and increase capacity. Cost over $75,000 with equipment.

Village Council, Rockville Center, N. Y., plans new municipal electric light and power plant. Cost over $200,000 with equipment. Financing will be arranged through Federal aid.

Signal Supply Officer, Army Base, Brooklyn, asks bids until Aug. 5 for telephone cable and four reels (Circular 3).

Colonial Body Corpn., 10-01 Fortieth Avenue, Long Island City, manufacturer of passenger and commercial automobile bodies, has leased factory at Forty-third Avenue and Eleventh Street, on site 100 x 165 ft., for new plant.

General Aniline Works, Inc., 1150 Broadway, New York, manufacturer of industrial and other chemicals, dyestuffs, etc., will break ground early this month for four-story addition to plant at Rensselaer, N. Y. Cost over $75,000 with equipment.

Alligator Rubber Products Co., 110 Lillie Street, Newark, N. J., manufacturer of rubber goods, has purchased one-story factory, 50 x 200 ft., at 237 Ridgewood Avenue, for new plant. Acquisition includes adjoining plot, 50 x 125 ft., for future expansion.

Commissioner of Institutions and Agencies, State Office Building, Trenton, N. J., asks bids until Aug. 7 for boilers, stokers and accessory equipment, coal and ash-handling machinery, underground steam conduit and other equipment for power plant at New Jersey State Hospital, Trenton. Entire project to cost close to $100,000.

Commanding Officer, Picatinny Arsenal, Dover, N. J., asks bids until Aug. 19 for 150 12-in. cast iron target projectiles, 600 12-in. gun shells, 400 12-in. mortar shells, 100 14-in. gun shells, and 25 16-in. target practice projectiles (Circular 8).

Lykens Wire Cloth Co., Lykens, Pa., manufacturer of woven wire products, has acquired former plant of Lykens Knitting & Mfg. Co., and will improve for new works, to be ready for service in September.

Supply Officer, Naval Aircraft Factory, Navy Yard, Philadelphia, asks bids until Aug. 6 for 22,500 sq. ft. welded wire fabric (S. & A. Req. 6010).

Quartermaster Depot, Twenty-first and Johnston Streets, Philadelphia, asks bids until Aug. 9 for one combined power machine (Circular 8); until Aug. 12 for metal badges, bars, etc. (Circular 11).

Pennsylvania Railroad Co., Pennsylvania Terminal, Philadelphia, has taken out permit for one-story shop addition at Todd's Cut shops, Wilmington, Del. Cost close to $23,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Aug. 6 for one universal cutter and tool grinder for Philadelphia Navy Yard (Schedule 5639).

NEW ENGLAND

United American Bosch Corpn., Main Street, Springfield, Mass., manufacturer of magnetos and kindred products, has let general contract to Ernest F. Carlson, Inc., 1694 Main Street, for one-story addition, 110 x 240 ft. Cost close to $60,000 with equipment.

School Board, Fitchburg, Mass., plans manual training department in new multi-story high school, 284 x 396 ft., for which bids will be asked on general contract in August. Cost about $1,000,000 with equipment. Financing has been arranged through Federal aid. Coolidge, Shepley, Bulfinch & Abbott, 1 Court Street, Boston, are architects.

International Harvester Co., New Haven, Conn., motor truck division, has let general contract to Smith Construction Co., Derby, Conn., for one-story addition to factory branch, service and repair building, 75 x 190 ft., at West Haven, Conn. Cost about $50,000 with equipment. Main offices are at Chicago.

Sunoco Helps Obtain the Rated Capacities of Machine Tools

Why has Sunoco Emulsifying Cutting Oil won consistent use in leading machine shops?

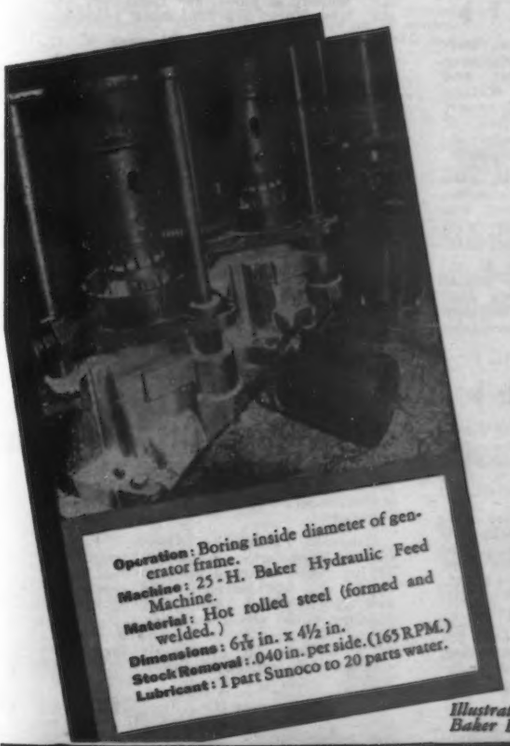
Check up its performance records! They tell the story!

You'll find that Sunoco helps avoid the costly handicaps of frequent tool regrindings, rejected work through faulty finish, inaccurate tolerances and slowed-up production. It's a superior lubricant, a superior coolant.

Experienced machinists know Sunoco. They have seen at close hand how it aids machine tools in producing better work with greater ease and efficiency.

That holds true of the grinding operations, too. Sunoco is a factor in eliminating burning and glazing; it makes possible faster stock removal without increasing wheel wear.

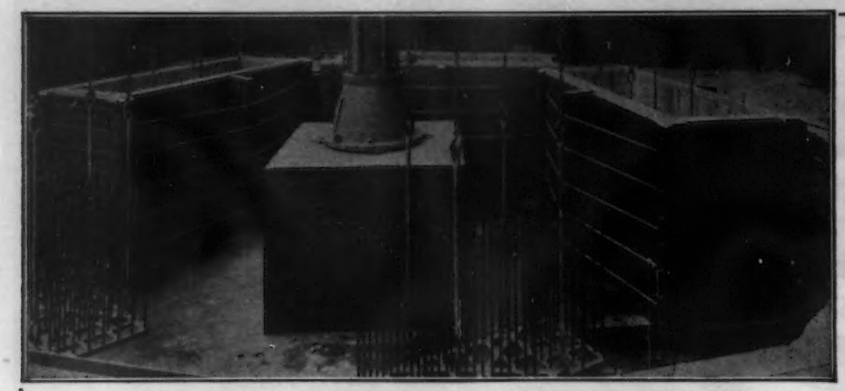
May we send further information or may our cutting oil engineers cooperate?


Operation: Boring inside diameter of generator frame.
Machine: 25-H. Baker Hydraulic Feed Machine.
Material: Hot rolled steel (formed and welded.)
Dimensions: 6⅞ in. x 4½ in.
Stock Removal: .040 in. per side. (165 R.P.M.)
Lubricant: 1 part Sunoco to 20 parts water.

Illustrations through Courtesy of Baker Bros., Inc., Toledo, Ohio

SUNOCO
EMULSIFYING
CUTTING OIL

SUN OIL COMPANY Philadelphia



WOOLFORD BUILT PICKLING TANKS ARE DEPENDABLE

Because only the most carefully selected material and experienced workmanship go into their construction.

G. WOOLFORD WOOD TANK MFG. CO. (FACTORY DARBY, PA.) **Paschall P. O., Phila., Pa.**

Metcalf Steel Tie Corpn., Danbury, Conn., has been organized by Frank G. Metcalf, Sandy Hook, Newtown, Conn., and C. A. Seifert, Danbury, to manufacture metal railway ties and kindred metal products.

School Board, Mexico, Me., plans manual training department in new two-story high school, for which bids will be asked soon on general contract. Cost over $100,000. Coombs & Harriman, Ridlinville, Me., are architects.

WESTERN PA. DIST.

Appalachian Electric Power Co., Bluefield, W. Va., plans rebuilding part of power plant at Kenova, W. Va., recently destroyed by fire, caused by an explosion. Loss about $35,000 with equipment.

Kittanning Limestone Supply Co., Ford City, Pa., is considering one-story storage and distributing plant on Highway 422, soon to be re-routed in this section, with conveying, loading and other mechanical equipment for barge service.

Cooper-Bessemer Corpn., Grove City, Pa., manufacturer of gas engines and parts, oil well equipment, etc., is planning removal of larger part of plant at Mount Vernon, Ohio, to Grove City, where production will be concentrated in future. All shops are expected to be removed by Oct. 1.

OHIO AND INDIANA

General Soap Corpn., 513 Peck Building, Grand Rapids, Mich., recently organized by John J. Vay, Jr., 13389 Madison Avenue, Lakewood, Ohio, and associates, has purchased one-story factory at Madison Avenue and West 115th Street, Cleveland, 60 x 190 ft., with power house, and adjoining tract, 82 x 300 ft., for future expansion. Building will be remodeled for production of commercial and industrial soaps, industrial chemicals, etc. Machinery installation will cost close to $50,000.

International Harvester Co., Springfield, Ohio, motor truck division, with headquarters at Chicago, has begun expansion at first noted plant, to include additional equipment. Cost close to $700,000 with machinery. Company will also carry out expansion at other automotive plant at Fort Wayne, Ind., used for parts production and assembling. Cost about $1,000,000 with machinery.

National Welders Mfg. & Supply Co., 1230 East Ninth Street, Cleveland, manufacturer of welding equipment and supplies; National Metal Spray & Supply Co., same city, manufacturer of metal spraying equipment and Newburgh Steel Co., 7120 Kinsman Avenue, Cleveland, have leased all available space, about 40,000 sq. ft., in former plant of Lupton Mfg. Co., 3283-99 East Eightieth Street. Companies noted will occupy for respective new plants, National Metal Spray company using about 25,000 sq. ft. floor area, and remainder of space divided between other two companies noted.

Contracting Officer, Material Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until Aug. 6 for gasoline and oil meters (Circular 29); until Aug. 7, adapters for engine and torque stand shroud supports (Circular 33); until Aug. 8, 150 voltmeter assemblies and 300 ammeter assemblies (Circular 19), 764 engine gage units and 1057 thermometer assemblies (Circular 21), 405 tool kits (Circular 40); until Aug. 12, 72 oil temperature regulator assemblies (Circular 24), 500 battery container assemblies (Circular 35), Venturi assemblies (Circular 43).

Ralston Purina Co., Lafayette, Ind., manufacturer of cereals, with main offices at 835 South Eighth Street, St. Louis, has let general contract to Jones-Hettelsater Construction Co., Mutual Building, Kansas City, Mo., for addition to plant at Lafayette. Cost about $100,000 with machinery. Part of new unit will be equipped for soy bean oil production. J. W. Young is resident manager at Lafayette.

BUFFALO DISTRICT

American Laundry Machinery Co., Buffalo Road, Rochester, N. Y., manufacturer of mechanical laundry equipment and parts, has let general contract to Werner Spitz Construction Co., 11 Comfort Street, for one-story and basement addition, 60 x 140 ft., for expansion in foundry division. Cost over $50,000 with equipment.

Niagara Frontier Food Terminal, 1500 Clinton Street, Buffalo, has filed plans for multi-story addition to storage and distributing plant. Cost over $85,000 with equipment.

Board of Education, Ogdensburg, N. Y., is planning new two-story trade school for boys, to be known as George Hall Trade School. Cost close to $150,000 with equipment. Financing will be arranged through Federal aid.

SOUTH CENTRAL

Southland Cotton Oil Co., Mill and Fortification Streets, Jackson, Miss., manufacturer of cottonseed oil products, has plans for one-story addition, 180 x 190 ft. Cost over $50,000 with equipment.

Director of Purchases, Tennessee Valley Authority, Knoxville, Tenn., asks bids until Aug. 26 for two 161-kva., eight 115-kva., and six 23-kva. outdoor type circuit breakers for Norris power plant; four 161-kva. and four 46-kva. similar circuit breakers for Wheeler power plant.

Pelican Well Tool & Supply Co., 901 McNeil Street, Shreveport, La., manufacturer of oil well drilling tools and equipment, has taken out permit for one-story addition. Cost about $22,000 with equipment.

Brown-Forman Distillery Co., 1908 Howard Street, Louisville, will soon take bids for multi-story addition for storage and distribution. Cost over $150,000 with equipment. Plans are also under way for two additional multi-story extensions for similar service, each to cost close to like sum.

City Council, Kingsport, Tenn., plans new municipal airport, including hangars, with shop units for reconditioning and repairs, oil storage buildings, and other units. Fund of about $500,000 is being arranged through Federal aid for buildings and equipment.

SOUTH ATLANTIC

South Carolina Public Service Authority, Charleston, S. C., Burnet R. Maybank, Charleston (mayor of city), chairman, has secured approval of grant and loan from PWA for $37,500,000 for hydroelectric power and navigation project on Santee and Cooper rivers in eastern part of State. Project will include power dam, electric generating station, power substations and switching stations, transmission and distributing lines, and service facilities. It is proposed to begin active work early in fall. Murray & Flood, 369 Lexington Avenue, New York, are consulting engineers.

Board of Education, Edenton, N. C., John A. Holmes, school superintendent, plans manual training department in new two-story high school. Fund of $175,000 has been secured through Federal aid. Bids will be asked soon on general contract.

State Department of Agriculture, State House, Tallahassee, Fla., chemical division, plans new four-story chemical and technical laboratory, 50 x 108 ft. Cost about $180,000 with equipment, including metal laboratory furniture, precision equipment, etc. Philip F. Kennard, Tallahassee, is architect.

Town Council, Westminster, S. C., plans municipal hydroelectric power plant on Chauga River, including transmission and distributing lines. Fund of $114,000 is being arranged through Federal aid. L. V. H. Hobson, mayor, is active in project.

WASHINGTON DIST.

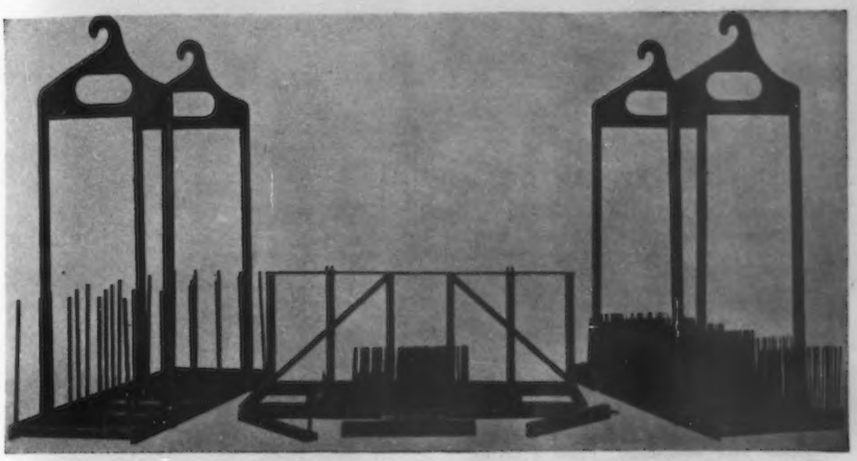
D. E. Foote Co., Crumpton, Md., plans rebuilding fruit-canning plant recently destroyed by fire. Loss about $75,000 with equipment.

General Purchasing Officer, Panama Canal, Washington, asks bids until Aug. 12 for copper-covered steel tubing, dredge chain, one motor-driven band saw, hacksaw, power drill, and sander, 5000 lb. foundry nails, chain bolts, sash fasteners, barrel bolts and other hardware products, 10,000 railway tie plates, six low switch stands and other equipment (Schedule 3077).

Gunther Brewing Co., Inc., 1211 South Conklin Street, Baltimore, will soon begin superstructure for one-story addition, for which general contract recently was let to Consolidated Engineering Co., 29 East Franklin Street. It will be used in part for rack house and kindred service. Cost over $50,000 with equipment. C. H.

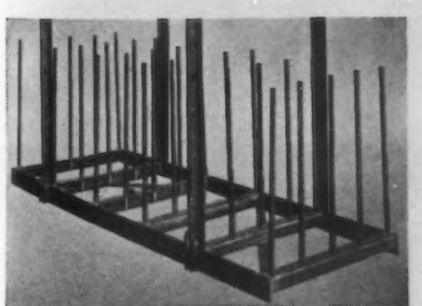
PICKLING CRATES *that* ELIMINATE DRAG *from production*

***Exceptionally light in weight... All-welded construction... Adjustable for character of load... and made of* MONEL METAL**



Five of these all-welded, light-weight Monel Metal pickling crates were recently built by The Youngstown Welding & Engineering Co., Youngstown, Ohio, for a steel products plant in Michigan. The crate bottoms, interchangeable spacing members, pins and pick-up device are all constructed of hot rolled Monel Metal from standard mill forms. The hooks, only, on the detachable pick-ups are cut from heavy steel plate.

FOR MANY YEARS Monel Metal pickling crates built up of riveted rods, angles, channels and flats, have been giving satisfactory service. Now,—due to the development of Monel Metal Gas Welding Rod No. 43 which produces strong, dense corrosion-resistant welds,— even lighter, longer-lived, more economical crates are possible.



Close-up view of one of the welded Monel Metal crates as shown above arranged with pins for wide spacing. Note the light-weight channel construction of the cross-members.

The welded Monel Metal crate bottoms illustrated weigh only 242 lbs. each and are designed for a working load of 8,000 lbs. Similar cast bronze crates designed for the same load would weigh approximately 710 lbs.

These welded crates can be designed to be adjustable for various sizes and thicknesses of sheets . . . by providing cross-members punched for spacing the pins to suit the work. For extreme lightness, even the pins may be hollow... of heavy-wall seamless Monel Metal tubing with swaged ends closed by welding.

Latest 24-page booklet "Equipment Designs for the Pickle House," sent free for the asking.

Solves Long-Standing Problem

A problem which has long troubled gas companies has been solved at the Portland Gas and Coke Company, of Portland, Ore. Serious corrosion was experienced with dry vacuum pumps handling air and gases in the filtration of lamp black. The steel valve strips were so rapidly destroyed that a trial of other metals was made, resulting in the selection of Monel Metal strip.

Largest Ever Cast

The largest alloy steel locomotive cylinders ever cast in this country were for the Great Northern Railway. Cast of 2% Nickel Steel. Two cylinders to a set — weighing 7,000 pounds each, plus saddle weighing 3,000 pounds: total weight, 17,000 pounds per set.

New Use for Nickel Wire Screens

It is generally considered advisable to separate steel products when packing in containers for nitriding. One manufacturer suggests the use of Nickel wire screens to accomplish this. He gives the packers an ample supply of such screens of various sizes, and in this way has been able to cut down the time of packing a standard nitriding box by about 20 minutes. This plant uses standard "V" blocks of Nickel Steel for supporting long shafts and other cylindrical parts, to prevent sagging or warping during nitriding.

Boiler-Feed Pump Rods

Contenders for the long-service-on-hard-duty record are the Monel Metal boiler-feed pump-rods in the Moon Island plant of the United Arcadia-Vermillion Rice Irrigating Co., Crowley, Louisiana. Back in 1925, after several seasons of pumping salt-water, examination showed little or no wear... and former packing troubles had been forgotten. At the end of 13 years' service, these rods were still on the job, according to J. W. Embry, Chief Engineer.

For Long Hard Pulls in Europe

The longest main driving rods in the world are used on the specially designed locomotives of the Austrian Federal Railways that pull crack passenger trains over steep grades. These rods are made of 3% Nickel Steel, providing strength and length, but without increase of weight or cross-sectional area.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York, N. Y.

Monel Metal is a registered trade-mark applied to an alloy containing approximately two-thirds Nickel and one-third copper. Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.

Gage Blocks, Scriber and Center Point in the Adjustable Holder are used to establish locations within one ten-thousandth of an inch.

•

* Visit the Johansson Display at the Machine Tool Show, Cleveland—Booth A-201 *

Greater Accuracy for your
JIGS *and* FIXTURES

THE accuracy of Jigs and Fixtures can be no greater than the accuracy of the methods used to lay them out. You can obtain greater precision in layout work when you use

JOHANSSON
GAGE BLOCKS and ACCESSORIES

FORD MOTOR COMPANY
JOHANSSON DIVISION DEARBORN, MICHIGAN

Osborne, 222 West Franklin Street, is architect.

Purchasing Officer, Department of Interior, Washington, asks bids until Aug. 6 for six truck shovels (Proposal 848); until Aug. 8, two V-type snow plows (Proposal 769).

Purchasing and Contracting Officer, Holabird Quartermaster Depot, Baltimore, asks bids until Aug. 16 for motor truck parts (Circular 6).

Frank L. Wright Distilling Co., Loreley, Md., has approved plans for addition for storage and distribution. Cost over $65,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Aug. 6 for one or two automatic chucking machines (Schedule 5640), one impact testing machine (Schedule 5655), one or three motor-driven chucking machines (Schedule 5648), two motor-driven bench lathes (Schedule 5656); until Aug. 9, three automatic indexing table type drilling machines and tools (Schedule 5637), for Washington Navy Yard; until Aug. 6, 20,000 lb. electrodes (Schedule 5654), for Norfolk, Va., Navy Yard; until Aug. 9, 38 indicating type pyrometers and spare parts (Schedule 5625), cotter, escutcheon and taper pins (Schedule 5618), for Eastern and Western navy yards.

MICHIGAN DISTRICT

Kelsey-Hayes Wheel Corpn., 3000 Military Avenue, Detroit, manufacturer of steel automobile wheels and kindred automotive equipment, has let general contract to Martin Krausmann Co., 955 East Jefferson Street, for new one-story foundry. Cost about $55,000 with equipment.

Michigan Carton Co., Battle Creek, Mich., has plans for new power house, including 50-ft. steel stack. Cost about $75,000 with equipment. Shreve, Anderson & Walker, Book Building, Detroit, are architects.

Peet Packing Co., Chesaning, Mich., has approved plans for addition to food products packing plant, including extensions and improvements in power plant. Cost over $60,000 with equipment.

MIDDLE WEST

Union Tank Car Co., 228 North La Salle Street, Chicago, has awarded general contract to Campbell, Lowrie & Lautermilch Corpn., 400 West Madison Street, for one-story addition, 75 x 340 ft., at works at Whiting, Ind. Cost about $100,000 with equipment. Battey & Kipp, Inc., 231 South La Salle Street, Chicago, is architect and engineer.

International Harvester Co., 606 South Michigan Boulevard, Chicago, has let general contract to R. H. Burkhardt, same address, for one-story addition to plant at 2600 West Twenty-sixth Street, 132 x 166 ft., primarily for storage and distribution. O. A. Krueger is company architect.

Village Council, Spring Valley, Minn., will take bids on general contract about middle of August for new municipal electric light and power plant, using Diesel engine-generating units. Fund of $110,000 has been arranged for building and equipment, including electrical distribution lines. G. M. Orr & Co., Baker Building, Minneapolis, are consulting engineers.

Hiram Walker & Sons, Inc., Peoria, Ill., distiller, plans early rebuilding of plant unit No. 3, recently destroyed by fire. Structure was used for storage and distribution. Loss over $2,000,000 with equipment.

United States Engineer Office, St. Paul, Minn., asks bids until Aug. 8 for dam No. 7, Mississippi River, including operating machines, electrical heating system, locomotive crane and other equipment (Circular 5).

Board of Trustees, State Training School, Plankinton, S. D., has authorized plans for new steam power house, installation to include two 100-hp. boilers, stokers, pumps and other equipment. Cost about $55,000 with equipment. Floyd F. King, Western Building, and Walter J. Dixon, Woelfel Building, both Mitchell, S. D., are associate architects. Charles Trimmer, Plankinton, is engineer.

Quartermaster Depot, 1819 West Pershing Road, Chicago, asks bids until Aug. 7 for 200 cross-cut saws, 3480 metal ash or garbage cans, and other supplies (Circular 10); until Aug. 15, eight portable platform scales, each 2000-lb. capacity (Circular 9).

SOUTHWEST

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Aug. 6 for one motor-driven lathe for station at Kansas City, Mo. (Schedule 5642).

City Council, Kansas City, Kan., has arranged Federal financing in amount of $1,325,000 and additional bond issue to make gross fund of about $2,000,000 for new municipal grain elevator and loading dock on Missouri River Levee, with elevating, conveying, screening and other mechanical-handling equipment. Horner & Wyatt, Board of Trade Building, Kansas City, Mo., are consulting engineers.

Thompson Pump Co., Okmulgee, Okla., has been organized by A. B. Settle and R. D. Thompson, Okmulgee, to manufacture pumping machinery and parts.

Springfield Auto Works, Inc., Springfield, Mo., manufacturer of automobile equipment, has leased space in building at 421 East Tenth Street, Tulsa, Okla., for new factory branch, storage and distributing plant.

G. C. Kirn Advertising Sign Co., 2739 Washington Street, St. Louis, manufacturer of electric signs and displays, etc., has let general contract to J. E. Williams Construction Co., 6914 Dartmouth Street, for new one-story plant, 50 x 135 ft. Cost close to $40,000 with equipment.

Board of Education, Lawrence, Kan., plans manual training department in new two-story junior high school. Cost about $200,000 with equipment. Thomas Larrick, 816½ Massachusetts Avenue, is architect. C. E. Birch is school superintendent.

Common Council, Haskell, Tex., has arranged bond issue of $35,000 and completed financing through Federal aid in amount of $45,000 for new municipal waterworks, to include pumping machinery and accessories, elevated steel tank and tower, pipe lines and auxiliary equipment. Morey & Morey, Praetorian Building, Dallas, Tex., are consulting engineers.

United States Engineer Office, Galveston, Tex., asks bids until Aug. 5 for electrical fixtures and equipment (Circular 27).

Board of Education, San Antonio, Tex., plans manual training shops in new one and two-story junior high school in northwest district. Cost about $100,000. Pheips & DeWees, San Antonio, are architects; Mathews & Kenan, Smith-Young Towers, are mechanical engineers.

PACIFIC COAST

Consolidated Virginia Mining Co., Virginia City, Nev., operating silver mining properties, has been acquired by new interests, headed by John J. Raskob, Wilmington, Del., and associates. Plans are under way for merger with Ophir Mining Co., Andes Corpn., Consolidated Virginia Mining Co. and Mexican Gold & Silver Mining Co., all operating gold and silver properties near Virginia City. Expansion and improvements will be made in different mines and mills, including new machinery. Cost about $350,000 with equipment. Zeb Kendall, Virginia City, will be an official of consolidated organization.

City Council, Alameda, Cal., plans extensions in municipal electric light and power plant, with installation of new equipment. New power substation will be built. Cost about $125,000 with equipment. Financing is being arranged through Federal aid.

Redlands Foothills Groves, Sixth Street and Central Avenue, Redlands, Cal., Clarence E. Perry, manager, plans new one-story fruit packing plant on local site. Cost about $150,000 with machinery, including precooling, air-conditioning, conveying, loading and other mechanical equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Aug. 6 for gasoline meters for San Diego Navy Yard (Schedule 5638); until Aug. 9, three airplane hoisting winches with drum and spare parts (Schedule 5620); until Aug. 13, one combined auxiliary air and circulating pump and spare parts (Schedule 5579), steel wire rope sockets (Schedule 5659), for Mare Island Navy Yard.

Columbia Winery & Fruit Distilling Co., Vancouver, Wash., care of Rudolph Weibel, Vancouver, head, recently organized, capital $120,000, is selecting site in Clark

Alloys of INTEGRITY
DEPENDABILITY
PHILO
BRAND
QUALITY • SERVICE
Ohio Ferro-Alloys Corporation
Canton, Ohio

WELDIT Gasaver

AUTOMATICALLY SHUTS OFF FLAME BETWEEN WELDS

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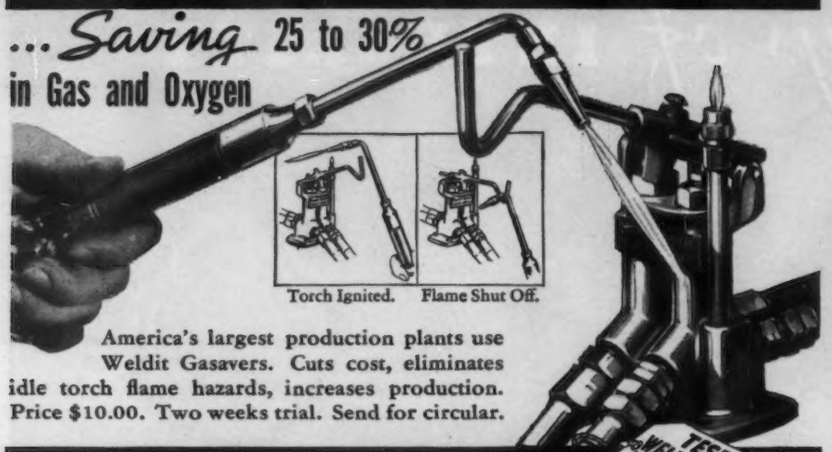

America's largest production plants use Weldit Gasavers. Cuts cost, eliminates idle torch flame hazards, increases production. Price $10.00. Two weeks trial. Send for circular.

WELDIT ACETYLENE CO. 641 BAGLEY AVE. DETROIT, MICH.

TEST THIS WELDIT GASAVER FREE FOR TWO WEEKS IN YOUR PLANT

County, near Vancouver, for new distillery, to consist of several units, with power house. Cost about $85,000 with machinery. Henry Huber, Vancouver, is interested in new company.

Chandler Heights Citrus Irrigation District, Chandler, Ariz., plans extensions in irrigation system, including new electric-operated pumping plant, electric power lines, pipe lines and other facilities. Fund of $47,000 has been secured through Federal aid.

◀ FOREIGN ▶

Bureau of Industry, Government of Uruguay, Montevideo, has approved plans for new oil refinery near city, to be operated as a Federal project. It will consist of several units, with battery of steel tanks and other storage and distributing facilities. A fund of about $2,500,000 has been authorized for plant.

National Cash Register Japanese Co., Ltd., Tokyo, Japan, a subsidiary of National Cash Register Co., Dayton, Ohio, has concluded merger with Nippon Cash Register Co., Ohito, near Tokyo, manufacturer of cash registers and parts, and will concentrate operations at last noted plant, where expansion will be carried out for production of certain types of Nippon registers and National machines and parts, also cabinets, bases, etc., for latter. Roger W. Burman will be managing director.

Lintex, Ltd., Manchester, England, manufacturer of flax fiber products under special process, plans new mill near Montreal, Que. Cost over $250,000 with machinery. Company is affiliated with Rylands & Sons, Ltd., Manchester. C. D. Silas is managing director.

GALE ENGINEERING CO., 136 Liberty Street, New York City, has been appointed as the representative for the Combustion Control Division of A. W. Cash Co., Decatur, Ill.

George W. Gale has been identified with combustion control work in New York City and the surrounding territory for several years, and was until just recently associated with the L. J. Wing Manufacturing Co.

Rockwell Products Is New Hartford Industry

CHARLES W. DEEDS, president of the newly organized Rockwell Products Co., has announced that Hartford, Conn., has been selected as the manufacturing headquarters of the company.

A contract has been closed with the Pratt & Whitney Co. whereby the devices patented by Edward A. Rockwell, covering automotive power brakes and other equipment, will be manufactured by the former company.

Besides Mr. Deeds, other officers are: Vice-president, Edward A. Rockwell; secretary and treasurer, E. L. Morgan. The directors include Mr. Deeds and Mr. Rockwell and Clayton R. Burt, president of Pratt & Whitney; Charles K. Seymour, president of Niles-Bement-Pond, and J. B. Hayward, well-known New York patent attorney.

According to the company's announcement, the power equipment to be offered to the automotive trade is especially adaptable for precise and positive control of buses, trucks, trailers and passenger cars.

The new devices, however, differ widely from the air and vacuum types now in general use in that they combine an electric hydraulic principle utilizing pressures five to six times greater than the present equipment.

Kempsmith Property Bought By Ryerson

PROPERTY of the Kempsmith Mfg. Co., Milwaukee, for many years a leading manufacturer of milling machines, was disposed of at a sheriff's sale July 16 under a foreclosure judgment of $231,000 entered in January, 1934, to the bondholders, who expect to sell the machinery and tools and lease buildings to other manufacturers. The concern was founded in 1888 by the late Frank Kempsmith, noted designer of machine tools, who disposed of his interest in 1901 because of ill health. In 1911 the shop was moved to a new plant of four buildings on a 10½-acre site at South Fifty-third and West Rogers Streets in West Allis. A large volume of business was done internationally, especially during the World War, and further expansion was undertaken. In 1926 the company was reorganized with a $200,000 mortgage bond issue. In 1931 its line of heavy-duty millers was sold to Joseph T. Ryerson & Son, Inc., Chicago. Production declined from then on and in the last few years has been suspended entirely, factory space having been rented to outside enterprises. At its peak the Kempsmith company manufactured 28 different types of millers, from small hand machines to 6-ton units, and employed 300 men.

Austin Co. Gets G. M. New Plant Contract

ALLISON ENGINEERING CO., Division of General Motors Corpn., has awarded the Austin Co., Cleveland, contract for a new plant at Speedway, Indianapolis, Ind., for the development and manufacture of liquid cooled aircraft engines. The plant will include four structures of modern design with welded steel construction and horizontal window areas completely encircling the buildings and will provide 41,000 sq. ft. of floor space.

The four buildings will include a manufacturing unit 122 x 251 ft., engine test unit 50 x 122 ft., power house 32 x 32 ft., and carpenter shop, dychromating and steel storage unit 50 x 90 ft. A machine shop and electric furnace room will be located in the manufacturing unit. Conveyor equipment to be installed will include a traveling crane and monorail hoist. The plant is designed to permit air conditioning at a later date.

A RUST-PROOFED PRODUCT *is Easier to Sell...*

THE rapid addition of many of the biggest names in American industry to the roster of users of Parker Processes definitely proves that "Rust is on the run".

An increasingly large percentage of the automobiles, refrigerators and many other Parker Processed products, coming from the country's accelerating production lines, shows that a rust-proofed product is easier to sell.

Rust prevention is a vital feature to the careful buyer. Rust is a costly, damaging factor that no longer need be tolerated. Parker Processes provide simple and economical methods for combating its destroying effects.

Whether it is a tiny screw, a heavy casting, or the polished finish for the automobile fender or body, there is a Parker Rust Preventing Process that will meet the requirements. Put your rust prevention problem up to the Parker Engineers.

PARKER RUST-PROOF COMPANY
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Literature describing the Parker Process is available to interested manufacturers and technical men, including charts, showing the results of comparative tests.

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True Today—*as it was then*

Where trustworthy valves are wanted Jenkins Valves get preference . . . .

Most everything has changed since "Great-Grandfather's" time. But his standard of valve quality ... the Jenkins "Diamond" trade mark... has maintained a steadily growing reputation for integrity. Today, wherever valves are used this famous Mark is known. And wherever valves must be absolutely trustworthy it is commonly demanded as a positive assurance of efficiency and economy.

Apparatus buyers usually are valve buyers, too, and the Jenkins "Diamond" on your valve equipment is bound to contribute to a general impression of "quality throughout". Manufacturers of practically every type of apparatus have found it a valuable selling-point.

If your product requires valves to control the flow of steam, fluids or gas, ask to have a Jenkins Field Man consult with you. If you need special valves or have a problem of valve selection use Jenkins Engineering Advisory Service.

COLOR INDEX YOUR VALVES with new Jenkins Colored Valve Wheels. Their convenience and fine appearance please apparatus buyers. Send for Folder 165 which tells all about them.

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Jenkins Valves

BRONZE—IRON—STEEL SINCE 1864

Expansion of Unit Features

(CONTINUED FROM PAGE 31)

driven at a variable ratio through pick-off change gears and a speeder quadrant. Speeders may be used in any desired position. Their utility also includes threading with self-opening dies.

Force-feed, circulating-type oil system is employed. Tool lubrication is through a low-pressure centrifugal pump having 60-gal. per min. capacity. Oil guards are rail-mounted and of sliding type, with provision against dripping to floor.

Automatic stop provides the usual safeguards and, in addition, has a control which may be set for one complete cycle of operations, which cycle terminates with tools and slides withdrawn; this to facilitate setting-up operations.

Motor mounting is in the base and is completely inclosed. Initial drive is from motor through silent chain through to initial main drive and high-speed shaft. Motor lubrication is convenient.

Steel Lookout Towers

(CONTINUED FROM PAGE 27)

Hence, forest lookout towers are at one of the sources of protection in the erosion campaign, and are being stressed more than when they were thought of only as part of the program of forest economics.

More than 41,000,000 acres of private forests are burned over every year, according to F. A. Silcox, United States Forester.

Records for 15 years have shown a rapidly mounting deficiency of precipitation. The resulting shortage of ground water affects vegetation, reduces the moisture content of our forest cover as a whole, shrinks the streams and springs, and makes the forests more inflammable during the annual dry season. The extreme drouth of 1934 capped a climax.

Westinghouse Transfers Air Conditioning Dept.

THE air-conditioning department of the Westinghouse Electric & Mfg. Co. has been transferred from East Pittsburgh to Mansfield, Ohio, where it will be a part of the merchandising division. This transfer affects all sales, engineering and manufacturing activities of the department. The purpose of the change, according to A. E. Allen, vice-president in charge of merchandising operations, is to effect a closer coordination, particularly in the design and manufacture of air-conditioning equipment with the other closely allied products now within the scope of the merchandising division.

The engineering and manufacturing of air-conditioning products will be centered at the East Springfield, Mass., plant of the Westinghouse company. The sales headquarters will be located at the Mansfield plant, the headquarters of the merchandising division. S. F. Myers will continue as manager of air-conditioning sales in the refrigeration and air-conditioning department.

UALITY THAT CAN BE SEEN AND SENSED

Examine a shipment of Cleveland Cap Screws and you will not be doubtful about their physical properties. They have the appearance of a very fine product . . . and they are. Threads are accurate—your micrometer will prove *that*. Heads are true, concentric with the shank—your gauge will show *that*. Full finished, all over, as you can see. Made by the Kaufman Process, *patented*, you have in your hands a cap screw of extraordinary thread strength and accuracy; heads will not shear or break. These *are* better cap screws. Order from your Distributor, nearest warehouse or the factory. Catalog D and current Discounts sent you gladly.

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Costs and Profits in Manufacturing Industry Analyzed

THE National Industrial Conference Board recently completed a comprehensive analysis of costs and profits in manufacture covering the 20-year period, 1914 to 1933. This study has been published by the board under the title, "Costs and Profits in Manufacturing Industry, 1914-1933."

In brief, the findings of the board are as follows:

1. In the past 20 years manufacturing operations in this country were characterized by a generally downward trend in the proportion of material costs to total costs, unsteady movements in labor costs, a substantial increase in overhead, and uncertain movement in profits.

2. Manufacturers' sales. The value of manufactured goods sold at producers' prices increased from $15,323 million in 1914 to $47,189 million in 1929. In 1933 it declined to $20,735 million. The share of manufactured goods sold in the total value of all goods sold and construction completed fluctuated during this period between 82.3 per cent and 72.8 per cent.

3. Cost of Materials. Of total manufacturers' receipts for goods sold to wholesalers, jobbers, and retailers, the part expended for the purchase of materials, fuel and energy, and containers varied from 29.6 per cent to 38.4 per cent. These low and high points came in depression years; the former in 1933, the latter in 1921. The percentage of total receipts from the sale of manufactured goods absorbed by expenditures for materials has been declining in the past 20 years.

4. Wages. The cost of direct labor as reflected in wage payments, varied between 24.6 per cent and 28.2 per cent of the total value of goods sold. The proportion of direct labor costs in the total increased from 1914 through 1923, when a decline set in. In 1929, wages represented 24.6 per cent of the total value of goods sold. The share of wages remained practically unchanged in 1931, and advanced to 25.4 per cent of the total in 1933.

5. Salaries accounted for an increased proportion of total receipts from the sale of goods in depression years, but the share going to salaries showed no marked upward movement from 1914 to 1929, fluctuating between 7.2 per cent and 8.9 per cent. This proportion advanced to 12.5 per cent in 1931 and 12.4 per cent in 1933, owing to the necessary fixity of salary payments in relation to other costs.

6. Overhead costs have absorbed an increasing proportion of the total value of goods sold since 1914. Interest and taxes, showed no substantial change. Being fixed charges, they became relatively heavier in depression years. Miscellaneous indirect expenses, such as rent, insurance, advertising, bad debts, and the like, on the other hand, became a decidedly larger proportion of total receipts. In 1929 the total of all overhead costs was 28.9 per cent of the total value of receipts for goods, as compared with 22.3 per cent in 1919, the earliest year for which a comparable figure can be computed. In 1931, these costs were 36.5 per cent of receipts.

7. Profits, the residuals of manufacturers' receipts after all charges are met, were affected by conditions obtaining at any given time. In 1919, a year of shortage of goods, profits were 6.6 per cent of the receipts from the sale of goods. In the depression year 1921, manufacturing operations incurred a deficit of 3.5 per cent. From 1923 through 1929 profits moved between a low of 2.8 per cent and a high of 5.2 per cent. In 1931, the latest year computable on this basis, a deficit of 5.5 per cent was incurred. In the years from 1919 through 1929, the post-war period leading up to the depression, the rate of profit moved neither consistently upward nor downward but fluctuated within a fairly wide range.

FOR PRECISION MANUFACTURE

WHERE UNIFORMITY AND HIGH PHYSICAL PROPERTIES ARE ESSENTIAL . . . DEPEND ON

JALCASE

The Diesel engine injector cup illustrated at the left is an outstanding example of the advantages which result from the use of Jalcase steel in modern precision manufacture. Note the tip (indicated by arrow) which is only .08" in diameter. The lower picture shows this tip enlarged to 17.5 times actual size and reveals two of the six equally spaced holes, each only .007" in diameter, which are drilled in the tip.

The high physical properties required in this part demanded a high carbon open hearth steel. The successful accomplishment of the delicate and exacting operations involved in the machining and drilling of the tip called for an exceptionally clean, uniform steel. Cold Finished Jalcase in the .25/.35 carbon grade meets both of these requirements, and in addition provides greater machinability than any other grade having equal physical properties.

Jalcase steel is an original development by Jones & Laughlin and is supplied in three carbon grades, in hot rolled and cold finished. In the .10/.20 carbon grade Jalcase offers excellent case carburizing properties with machinability approaching that of Bessemer screw steel. Jalcase in the high carbon grades (.25/.35 and .30/.40 carbon) combines heat treating qualities superior to other carbon steels with better free cutting qualities than will be found in any other steel of comparable carbon content. In addition, Jalcase in all carbon grades is an excellent forging steel. Send for the special bulletin describing this unique J & L Steel product—no obligation.

J&L STEEL

OTHER J & L PRODUCTS

For Manufacturing: Bars, Shapes, Plates—Forging Steel—Bessemer Screw Steel—Shafting—Tubing—Cold Heading Wire—Spring Wire—Tin Plate and Black Sheets, Tin Mill Sizes.

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Step up PRODUCTION

WHY waste time working ordinary sheared plates into usable shape when you can buy B & L Extra Wide Flats already machined smooth and *cold-sawed* to accurate dimensions!

These handy sections are available in widths up to 12" and in thickness from ¼" to 2"—just the thing for bed plates, stripper plates, backing plates for dies, patterns, jigs, fixtures and equipment parts.

Nothing like them for saving assembly time, reducing machining costs and eliminating excess scrap. Easy to work to precision standards in fabricating your product, as they are *cold drawn* to uniform section, true flatness and size tolerances of plus .000" to minus .008"—and free from surface blemish.

An increasing number of steel users are adopting B & L Extra Wide Flats to simplify their manufacturing operations. Why not try these bar shapes in your shop?

Cold Finished Bars and Shafting ● Ultra-Cut Steel ● Special Sections ● Alloy Steels

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Ingots Yield Less Finished Steel Now Than Was the Case 30 Years Ago

BECAUSE steel buyers have demanded and secured increasingly better steel, finished to ever more stringent specifications, the steel industry finds itself able to produce less and less finished products from a ton of ingots, according to the American Iron and Steel Institute.

A study of the annual production of finished hot-rolled steel over the period 1904-1934 shows how sharply the yield has decreased. During the 10 years 1904-1913 the tonnage of finished rolled steel averaged 76.91 per cent of the tonnage of ingots produced; the remainder was scrap produced or metal actually lost during manufacturing operations. From 1925 to 1934, however, ingots yielded only 74.02 per cent of finished steel because of stricter specifications by customers and much more rigid inspection by the steel producers.

The descent has not been steady. In periods of low steel production the yield of finished hot-rolled steel from the ingot has tended to increase, possibly because it was often necessary to use only the most efficient steel-making equipment.

Conversely, during 1918, when the steel industry was called upon to produce such large tonnages that almost every serviceable piece of manufacturing equipment was needed, no matter what its efficiency, the yield from the ingot dropped to 68.71 per cent — the lowest during the period studied. Another factor which tended to decrease the yield in the war years was the fact that exports of semi-finished steel were approximately 1,000,000 tons above normal. The highest yield was 79.04 per cent, obtained in 1910, when production totals contained unusually large tonnages of rails, plates and other materials on which the yield is higher than on more highly finished products.

In 1932, when steel production was lower than in any year since 1900, the yield increased from 73.7 per cent in 1930 and 74.67 per cent in 1931 to 76.89 per cent. Since 1932, increasing demand for steel, accompanied by the continually tightening consumer specifications, has lowered the yield to 72.53 per cent in 1933 and 72.48 per cent last year. The latter two yields are the lowest of any except war years.

Recent improvements in steel-making equipment and practice appear to have slowed down the rate at which the yield of finished hot-rolled steel has been decreasing. The trend line over the entire period 1904-1934 falls at the rate of 0.12 per cent a year, while since 1922 the annual rate of decrease has been only 0.034 per cent.

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If you have a difficult problem of wire fabrication....or one that is new to you....we suggest that you submit it to our research workers. Quite possibly they already know the economical answer.

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Youngstown Wire Products are available in YOLOY, the high tensile corrosion-resistant alloy.

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All Lake Superior grades of

IRON ORE

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Sheffield Steel Industry Expanding

A NEW record for a week's output of steel from one furnace has just been set up at the Appleby-Frodingham works of the United Steel Companies combine, Sheffield. This furnace made a record a few months ago with a production of 2610 long tons; now it has beaten that figure by a substantial margin with an output of 2750 long tons 2 cwt. The works are now operating at capacity.

Activity in stainless, heat-resisting, and rust-resisting steel is not only maintained but is constantly increasing, and an interesting result of this is to be found in a transfer of operations which Thomas Firth & John Brown are proposing. Hitherto this concern has been producing its strip, carbon and alloy steels at its Tinsley works. At the same works Firth-Vickers Stainless Steels are concentrating on the production of stainless and "Staybrite" steels, and this business has increased to such an extent that more accommodation is required. It is therefore the intention to remove the strip, carbon, and alloy steel manufacture, and, in order to provide new quarters for these operations the Firth-Brown enterprise is negotiating for the purchase of part of the Cyclops works, Sheffield, formerly the home of Cammell Laird & Co.'s steel interests. The Firth-Brown concern last year installed additional mills for rolling stainless strip and sheet, and a large new factory for making engineers' small tools.

Another Sheffield concern, the Park Gate Iron & Steel Co., has also arranged for a large program of works development, which is to be spread over three years and to cost approximately £300,000 ($1,500,000). It will not mean any extension of the works in the strict sense of the word, but is an improvement project which includes the sweeping away of a few elements of plant that are not as economic as they should be.

Prominent among the items of the program are the installation of a cleaning apparatus for the blast-furnace gases, the electrification of two of the mills, the reorganization of the front of the melting furnaces, the improvement of the shop for dealing with ladles, the freeing of congestion in the casting shop, and the improvement of the railroad tracks on the premises.

Describes Prevention Of Corrosion

SINCE 1926 over 3000 articles on the corrosion of metals have been published. Manifestly, it is difficult for investigators to examine this voluminous technical literature and select that which is useful. Therefore the revised edition of "Corrosion, Causes and Prevention," by Frank N. Speller, recently published by McGraw-Hill Book Co., Inc., New York, is particularly valuable inasmuch as an inventory is taken of all available information and it is classified according to a simple and practical system. The subject-matter is devoted particularly to ferrous metals. Various theories of corrosion are reviewed, a study is presented as to the influence of factors external and internal to the metal, and a large section is devoted to different methods of preventing corrosion under a wide variety of exposure conditions.

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Day after day—week in and week out—train service is maintained for our transportation needs. We depend on it without question. » » A half century has seen constant improvement in equipment, schedules and methods of operation.

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Week in and week out for 38 years West Leechburg has been making *good strip steel*—the dependable kind. » » We too have made progress. Folks tell us that our steel is better than ever today. If modern equipment and methods, care and constant watchfulness make better steel—then our steel *is* better today.

If your production schedule depends upon good strip steel—why not West Leechburg?

WE ALSO ROLL AND SELL ALLEGHENY STAINLESS. ALL GRADES IN STRIP FORM

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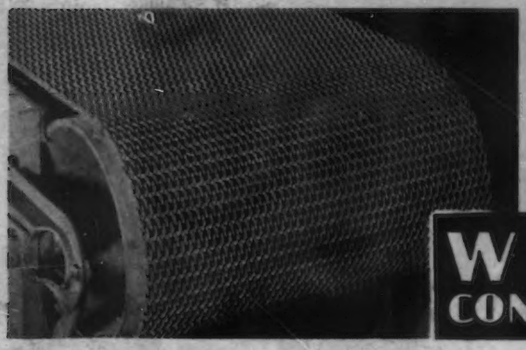

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WISSCO CONVEYOR BELTS

Activities Bearing on Machine Tools Distribution

o o o

A Department Conducted by L. M. Waite

o o o

One-Sided Contracts

In the June 20 issue of THE IRON AGE, this column carried a letter contribution on "Better Made Machine Tool Sales." The story dealt with abuses which are both unwholesome and common. These impose upon master tools of industry a requirement that they pass through periods of probation before being accepted as fit for regular duty in production lines; this even though they may be recognized products of leading machine tool shops.

Among other comments evoked by the letter referred to was this: "The gentleman who wrote the letter 'knows his way around,' for he deals intelligently with the expense factor and with the element of antagonism, both of which merit the attention of all concerned with the purchase and installation of modern machine tools. May I suggest that the discussion be carried further."

Guarantees

Commencement of the unnecessary expense and antagonism, to which reference is made, is well illustrated in a purchasing department clause which has recently been added to some machine tool orders released to distributers. Approximately, the clause is as follows: "You know what our requirements are. In accepting this order you are guaranteeing your equipment to meet these requirements in every detail. Beyond this, it is agreed by you that these machines shall perform to our entire satisfaction or be returned to you without expense on our part."

Over a period of years, purchasing departments have from time to time given birth to similar fetishes. Repeatedly these have been passed upon by courts as constituting one-sided contracts and therefore of little or no standing. However, it is seldom considered good advertising to go into court in settlement of disputes involving opinions as to what constitutes acceptability. Then again there are always those who are sufficiently order-hungry to "take a chance" on filling orders involving the acceptance of such clauses.

These two facts are known and recognized by a type of purchasing agents who lack in mechanical ability to select equipment and who, because of this, feel called upon to cover their weaknesses by providing a more expert authority to pass upon their selections before it shall be incumbent upon the purchaser to make payment. The procedure is a direct shift of responsibility and reflects no credit upon management.

Cause and Effect

Machine tool history has it that this type of clause is seldom a matter of discussion during preliminary conversations. It is most frequently added just before order signature. Its aim, it can be fairly said, is to support some contention that disbursements for maintenance of the purchasing department are very necessary for the safe and sound conduct of the particular organization which the department serves. However this may be, and it is really an unimportant detail, the fact is outstanding that such clauses are the cause of immediate antagonism which is more than liable to acquire breadth throughout a shop. Those to whom the buck is passed as to final acceptance resent the imposed responsibility. The order recipient, when he reads the clause, explodes with resentment. Even the clause writer himself resents the immediate implication that he is a rubber-stamp purchasing agent. No matter how much the equipment may be needed, its installation is off to a bad start.

There is not much point in saying that these clauses are brainstorms that originate in fertile but inexperienced brains when the facts are that they are a perfectly normal product of a machine tool sales policy, which in effect says: "We will send a demonstrator to your shop to set up the machine and remain with you a sufficient length of time to thoroughly acquaint your operators with the operation of the machine and to demonstrate our claims for it."

The granting of service of this

"FOR IT WAS FOUNDED UPON A ROCK"

—THE ROCK OF MAINTAINED QUALITY. AND ALTHOUGH THE FLOODS OF CHEAPNESS AND INFERIORITY HAVE BEATEN HARD UPON IT, EVERY PERSUASION TO LOWER THE QUALITY STANDARD OF CLEVELAND TWIST DRILLS AND REAMERS HAS BEEN ANSWERED, "NO." THE SHREWDEST OF BUYERS, THEREFORE, FIND THAT THIS SYMBOL ◇C◇ TODAY, AS IN THE PAST, REPRESENTS LOWEST COST PER HOLE DRILLED OR REAMED.

★ ★ ★ ★ ★ ★

THE CLEVELAND TWIST DRILL COMPANY, *Cleveland, Ohio, U. S. A.*
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BASIC ELECTRIC STEEL

Carbon, Alloy, Corrosion Resistant and Special Steels Smooth Forged, Hollow Bored, Rough or Finish Machined, Heat Treated to Specifications ... Forging Quality Ingots, Pressed or Hammered Billets.

NATIONAL FORGE AND ORDNANCE COMPANY

IRVINE, WARREN COUNTY, PENNA.

sort, which is referred to as free, and averaging its cost over all sales, has never created the original confidence which is essential to any well-made sale.

It has been suggested that this initial dissatisfaction, and much that follows it, might be removed through general agreement as to "straight orders" and the filing of a performance bond to cover such machine performance as may be a matter of possible uncertainty and therefore subject to proper guarantee. Legal, moral and practical responsibility could thus be definitely established at the outset. No necessity would exist for withholding payments, as the bonded assurance would provide protection in the event of production failure.

Performance Bonds

It has also been pointed out that a standard practice of this sort might easily, and to general advantage, transfer the point of demonstration back to the maker's shop from which it has been taken, in line with a competitive demonstration policy which in effect says: "We will demonstrate the machine in your own shop under your own shop conditions and with your own shop men."

A prominent manufacturer in recent conversation complained of the averaging of demonstration expense over a total number of sales. He stated that practically every order that comes in has some kind of "an if or and" proviso, and that there is seldom any comfortable certainty that a sale is really made, and that seemingly the expense of making a sale "stick" keeps mounting. "We have raised our prices several times in an effort to get a reasonable profit, but it seems as if each time we have to plow the proposed profit back into sales expense. I am satisfied that the averaging of this type of expense is detrimental from an order standpoint, but I don't know how it can be handled in any other way."

Reaction to the June 20 letter referred to above indicates that much thought is being given by both purchasers and sellers to the possibility of a rearranged technique in connection with the purchase and installation of master tools of industry. The existing system seems to be fraught with suspicion and involved in expense which bears no direct relation to the cost of machine building. This expense might be likened to a processing tax, sufficient in its averaged total to possibly defeat the very sales purpose which it is intended to serve. It may well instigate the inclusion of what are intended to be strictly whip-hand clauses which guarantee operation in strange shops and under rules of individual whims and preferences over which the guarantor has no control.

Builders of master tools of industry have demonstrated their ability to serve a common cause—production. Their further efforts should not be hedged about with requirements, which in the long run can tend only to create higher prices with the resultant possible curtailment of demand.

Machine Tool Congress Sessions Planned

THE following preliminary program of technical sessions and other activities has been prepared for the Machine Tool Congress, which will be held in Cleveland, Sept. 11-21, concurrently with the Machine Tool Show:

Sept. 11 and 12: Technical discussions under the auspices of the machine shop practice division of the American Society of Mechanical Engineers. George F. Nordenholt, division secretary.

Sept. 13: Dinner, American Society of Tool Engineers. Fred R. Lamb, vice-president.

Sept. 17: Dinner for foreign visitors. National Machine Tool Builders Association. F. H. Chapin, president National Acme Co., Cleveland, toastmaster.

Sept. 18 and 19: Technical discussions under the direction of production activity division of the Society of Automotive Engineers. Vincent Rumely, Hudson Motor Car Co., Detroit, vice-president.

Sept. 20: Executive meeting and election of officers Machine Tool Congress. Clayton R. Burt, president and general manager Pratt & Whitney Co., Hartford, Conn., presiding.

All sessions will be held at the Hotel Statler. Detailed program will be issued later.

Interprets X-Ray Photographs

"ENGINEERING RADIOGRAPHY" is the title of a new book by V. E. Pullin, the well-known English authority on radiological research. This book may be procured from G. Bell & Sons, Ltd., York House, Portugal Street, London, W.C. 2, England. The book makes no attempt to discuss physics of X-rays or technical matters concerning apparatus and its construction. On the other hand, there is a fund of valuable and authoritative information on the interpretation of radiographs. Mr. Pullin first generalizes on radiographic examinations, then describes various techniques, interpretation of engineering radiographs, radiographs of welds and radiography by means of radium.

MODERN ROLL TECHNIQUE

The whole world turns to Phoenix Rolls. The artist's drawing above shows a shipment of rolls to India. Phoenix Rolls are also in active service in Australia, England, Japan, Canada, Mexico and in fact in most countries where rolls are purchased on a basis of dollar and cents service obtained.

PHOENIX ROLLS

PHOENIX STEEL, for unusual strength; PHOENIX "A" (steel alloy), for strength and wear; PHOENIX METAL—PHOENIX "K", for strength, wear and finish; PHOENIXLOY (uniformly hard), for flat rolling where high finish of extremely thin gauge of material is required to be free from all marks or defects. Also tube mill rolls of quality material best suited to the kind of service required; PHOENIX CHILL; PHOENIX NICKEL CHILL, for all flat rolling requiring finish.

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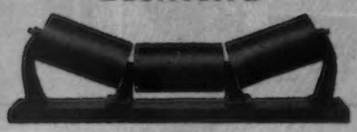

The lubrication of a Robins Conveyor Idler is simplicity itself . . . just one grease fitting conveniently and safely located at each end of the idler . . . just one shot in either fitting and the job is done. *No danger to life or limb. No danger of over-greasing.* This patented lubricating system is only one of the exclusively Robins features that are the reasons why Robins Conveyor Idlers last longer and cost less to operate.

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Methods of Checking Gears

(CONTINUED FROM PAGE 22)

mounted show a decided improvement in action over spur gears. This is largely due to the fact that in helical gears contact is progressive across the face of the tooth and is continuously at the pitch line in some one plane. Obviously, helical gears should operate more smoothly and quietly than spur gears, and as a matter of fact such is the case. Fig. 16 shows Red Liner charts of a helical gear in three conditions, namely, after cutting, hardening and lapping, the lapped gear shows considerable improvement over the hardened or the cut gear. In fact lapping has not only improved the tooth surface, but reduced the errors to about half of what they were originally in the cut gear.

Factory Employment Decreased in June

FACTORY employment during June decreased 1.7 per cent from May while payrolls declined 2.9 per cent, according to the regular monthly report of the Secretary of Labor. In both cases the declines were less than seasonal and June levels were well above those of June, 1934. Among manufacturing industries of major importance registering declines in employment were automobiles, blast furnaces, steel works and rolling mills, foundries and machine shops and electrical machinery, apparatus and supplies. Industries relating to building construction showed substantial gains.

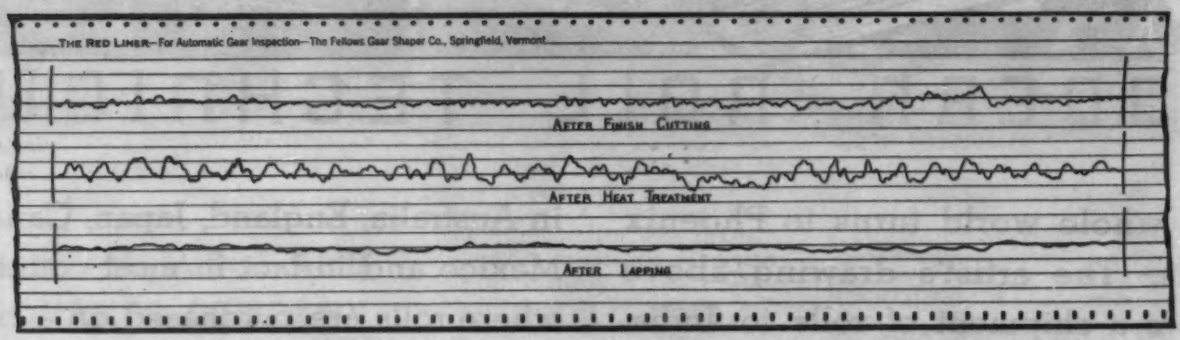
THE RED LINER—For Automatic Gear Inspection—The Fellows Gear Shaper Co., Springfield, Vermont
AFTER FINISH CUTTING
AFTER HEAT TREATMENT
AFTER LAPPING

FIG. 15—Chart comparing a spur gear in the "green," hardened and lapped condition.

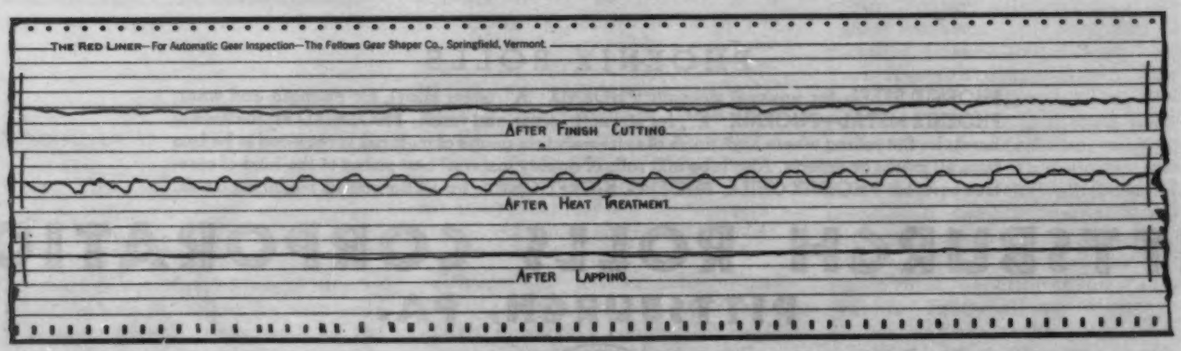
THE RED LINER—For Automatic Gear Inspection—The Fellows Gear Shaper Co., Springfield, Vermont
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FIG. 16—Chart of helical gear after cutting, hardening and lapping. The lapping reduced errors as well as improved the tooth surface.